

所別： 經濟學系 碩士班 不分組(一般生)

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科目： 總體經濟學

本科考試禁用計算器

\*請在答案卷 內作答

**General Instructions**

The exam includes 4 questions each consisting several sub-questions. The total points possible for the exam is 100 points. Answers should be provided clearly in an identifiable handwriting.

**Question 1: The Money Supply Process**

Treat all parts of the question as separate scenarios. They do NOT continue from one another.

- (5 points) Suppose the central bank conducts a \$100 billion open market purchase. Does the monetary base (MB = Currency in Circulation + Reserves) go up or down? By how much?
- (5 points) Suppose the central bank conducts a \$100 billion open market purchase. Suppose the required reserve ratio is 10% and the banks choose to carry no excess reserves. Does the money supply (M = Currency in Circulation + Deposits) go up or down? By how much?
- (5 points) Suppose the central bank increases the required reserve ratio above its current level. Will this change make the monetary base (MB) go up or down? Will this change make the money supply (M) go up or down? Please consider all possibilities.
- (5 points) Suppose the central bank lends to a bank through the discount window and credits its reserve account. Will this make the monetary base (MB) go up or down? Will this make the money supply (M) go up or down? Consider all possibilities.
- (5 points) Suppose a depositor withdraws cash from his/her bank account. Will this make the monetary base (MB) to up or down? Will this make the money supply (M) go up or down? Consider all possibilities.

**Question 2: Optimal Investment**

Consider the following two-period model of firm investment. In period  $t$ , the firm starts with  $K_t$  units of capital, produces  $F_t(K_t) = A_t(K_t)^{1/3}$  units of goods, and invests  $I_t$ . (Here,  $I_t$  can be negative. Negative  $I_t$  represents liquidation of the capital stock.) In period  $t + 1$  the firm starts with  $K_{t+1} = K_t + I_t - dK_t$  (where parameter  $d$  denotes the depreciation rate of capital) units of capital, produces  $F_{t+1}(K_{t+1}) = A_{t+1}(K_{t+1})^{1/3}$  units of goods, and has  $K_{t+1} - dK_{t+1}$  units of capital left over. Goods and capital can be sold at prices  $P_t$  and  $P_{t+1}$  in periods  $t$  and  $t + 1$  respectively. The nominal interest rate between periods  $t$  and  $t + 1$  is  $i_t$ .

- (5 points) Write down the maximization problem that the firm should solve.
- (5 points) Explain why the firm's objective function you described in part (a) makes economic sense.
- (5 points) What happens to the firm's optimal investment if the interest rate goes up? Provide an intuition for this result.

(Hint: For those who couldn't solve the model from part (a), take as given, for the remainder of this question, that the optimal investment will be such that the marginal product of capital equals the user cost of capital. More explicitly, at optimal investment,  $F_{t+1}'(K_{t+1}) = r_t + d$ , where  $r_t = (1 + i_t)(P_t/P_{t+1}) - 1$  is the real interest rate.)

- (5 points) What happens to the firm's optimal investment if current productivity  $A_t$  goes up? Provide an intuition for this result.
- (5 points) What happens to the firm's optimal investment if future (expected) productivity  $A_{t+1}$  goes up? Provide an intuition for this result.

注意:背面有試題

**Question 3: IS-LM Model**

Use the following information to answer parts (a)-(e).

$$\text{Consumption: } C = 1400 + 0.75Y_d + 0.08\frac{M}{P}$$

$$\text{Net exports: } NX = 400 - 0.25Y_d - 10r$$

$$\text{Taxes: } T = -200 + 0.2Y$$

$$\text{Disposable income: } Y_d = Y - T$$

$$\text{Investment: } I = 140 - 30r$$

$$\text{Government purchase: } G = 200 - 0.2(Y - Y_p), \text{ where } Y_p = \text{potential gross domestic product (GDP)}$$

$$\text{Aggregate demand: } AD = C + I + G + NX$$

$$\text{Goods market equilibrium: } Y = AD$$

$$\text{Money demand: } \frac{M_d}{P} = 0.25Y - 50r$$

$$\text{Money market equilibrium: } M = M_d$$

Note that exogenous variables are  $Y_p$ ,  $P$ , and  $M$  while endogenous variables are  $C$ ,  $NX$ ,  $Y_d$ ,  $r$ ,  $T$ ,  $AD$ ,  $Y$ ,  $I$ ,  $M_d$  and  $G$ .

- (5 points) Derive the *IS* curve. Indicate its slope.
- (5 points) Derive the *LM* curve. Indicate its slope.
- (5 points) Determine the equilibrium value for  $Y$ , if  $Y_p = 4,000$ ,  $P = 1$ , and  $M = 2,200$ .
- (5 points) Based on the results in part (c), is the governmental budget in surplus, deficit, or balance? If surplus or deficit, indicate the magnitude.
- (5 points) Show how the government might use fiscal policy (for example, change in the autonomous portion of  $G$ ) to bring GDP ( $Y$ ) in line with  $Y_p$ .

**Question 4: True or False Statements with Explanation.**

Read the following statements and say whether they are TRUE or FALSE. Briefly justify your answer. An answer without interpretation will get zero credit.

- (5 points) Aggregate demand falls when the price level rises, because higher prices cut real incomes.
- (5 points) An increase in the price of *some* imported goods will show up in the GDP (Gross Domestic Product) deflator but not in the Consumer Price Index.
- (5 points) An "Efficiency Wage" refers to the wage that is paid in a competitive labor market, equal to the value of the marginal product of labor.
- (5 points) In Mankiw's "Sticky-Price Model," the slope ( $dP/dY$ ) of the short-run aggregate supply curve depends positively on the amount by which some firms increase their prices in response to an increase in the economy's output.
- (5 points) According to the "Quantity Theory of Money", the rate of inflation must equal the rate of growth of the nominal money supply.