

- 單選題請於試卷內之「非選擇題作答區」標明題號依序作答。
- 非選擇題請依題號依序作答。請詳述理由或計算推導過程，否則不予計分。

Multiple Choice Questions (單選題)

1. (6 points) On Jan. 8, 2015, the open market operation (OMO) by the Central Bank of Taiwan is as follows: an amount NT\$644 billion of certificates of deposits (CDs) matures and an amount NT\$640 billion of new CDs is issued.
 - (a) This is an expansionary monetary policy; the OMO injects NT\$640 billion to the banking system; and these CDs are liabilities of the central bank.
 - (b) This is a contractionary monetary policy; the OMO takes back NT\$4 billion from the banking system; and these CDs are liabilities of the central bank.
 - (c) This is a contractionary monetary policy; the OMO takes back NT\$640 billion from the banking system; and these CDs are assets of the central bank.
 - (d) This is an expansionary monetary policy; the OMO injects NT\$640 billion to the banking system; and these CDs are assets of the central bank.
 - (e) This is an expansionary monetary policy; the OMO injects NT\$4 billion to the banking system; and these CDs are liabilities of the central bank.
 - (f) This is a contractionary monetary policy; the OMO takes back NT\$4 billion from the banking system; and these CDs are assets of the central bank.
2. (6 points) Which of the followings is correct about the Foreign Exchange Reserves (FER)?
 - (a) FER means the amount of foreign exchanges held by the public; it mainly comes from accumulation of excess exports; and it is a net wealth of the public.
 - (b) FER means the amount of foreign exchanges held by all financial intermediaries; it mainly comes from accumulation of hot money; but it is not a net wealth of the public.
 - (c) FER means the amount of foreign exchanges held by the public; it mainly comes from purchases of foreign exchanges by the central bank; and it is a net wealth of the public.
 - (d) FER means the amount of foreign exchanges held by the central bank; it mainly comes from purchases of foreign exchanges by the central bank; and it is a net wealth of the public.
 - (e) FER means the amount of foreign exchanges held by the public; it mainly comes from purchases of foreign exchanges by the public; but it is not a net wealth of the public.

見背面

3. (6 points) During the Great Depression 1930-33, data shows that monetary base (MB) increased by 20%, but the money stock (M1) in U.S. declined by 25%. This is because
- (a) The public raised currency-to-deposit ratio, banks held more excess reserves, and many banks bankrupted.
 - (b) The public lowered currency-to-deposit ratio, banks held more excess reserves, and many banks bankrupted.
 - (c) The public raised currency-to-deposit ratio, banks held less excess reserves, and many households bankrupted.
 - (d) The public lowered currency-to-deposit ratio, banks held less excess reserves, and many households bankrupted.
 - (e) The public lowered currency-to-deposit ratio, banks held more excess reserves, and many households bankrupted.
 - (f) The public lowered currency-to-deposit ratio, banks held less excess reserves, and many banks bankrupted.
4. (6 points) Suppose we estimate the following reaction function of a central bank:

$$R_t = \bar{R} + \alpha_1(\pi_t - \pi^*) + \alpha_2(y_t - y^*) + \alpha_3(q_t - q^*),$$

where R_t is the short-term interest rate, π_t and y_t are respectively inflation rate and output growth rate, and q_t is house price growth rate. Which of the followings is correct?

- (a) To stabilize the economy, we expect that $\alpha_1 > 1$, $\alpha_2 > 0$, and $\alpha_3 < 0$.
- (b) To stabilize the economy, we expect that $\alpha_1 < 1$, $\alpha_2 > 0$, and $\alpha_3 > 0$.
- (c) To stabilize the economy, we expect that $\alpha_1 < 1$, $\alpha_2 < 0$, and $\alpha_3 = 0$.
- (d) For a central bank adopting Inflation Targeting, we expect that $\alpha_1 > 1$, $\alpha_2 > 0$, and $\alpha_3 = 0$.
- (e) For a central bank adopting Inflation Targeting, we expect that $\alpha_1 > 1$, $\alpha_2 = 0$, and $\alpha_3 = 0$.
- (f) For a central bank adopting Inflation Targeting, we expect that $\alpha_1 = 1$, $\alpha_2 = 0$, and $\alpha_3 > 0$.

5. (6 points) Let the natural rate of growth $y^* = 5\%$ and the natural rate of unemployment $u^* = 6\%$. Suppose the current expected inflation rate $\pi^e = 3\%$. Given the current expected inflation rate, the current unemployment rate and inflation rate is $(u, \pi) = (4\%, 5\%)$.
- The short-run Phillips curve is $\pi = 0.03 - (u - 0.05)$ and long-run Phillips curve is $\pi = 0.03$.
 - The short-run Phillips curve is $\pi = 0.03 - (u - 0.06)$ and long-run Phillips curve is $u = 0.06$.
 - The current unemployment rate and inflation rate $(u, \pi) = (4\%, 5\%)$ will persist in the long run.
 - If an expansionary monetary policy pushes (u, π) to $(3\%, 6\%)$, this means that the short-run Phillips curve has shifted outwards.
 - If the central bank keeps using expansionary monetary policy, under rational expectations, the public will raise their inflation expectations gradually and the Phillips curve becomes vertical in the long run.

Analytical Questions (非選擇題)

6. (Borrowing Constraint) Consider a two-period model, $t = 1, 2$, in which the utility function of a consumer is given by $U = \ln(c_1) + \beta \ln(c_2)$. A consumer is endowed with an asset (land or house) k and consumption good z at date 1. The price of asset in terms of consumption good at date 1 is q_1 , and the asset has no value at date 2. The asset can be used to produce output $y = A \times k$ at date 2. Let b_1 is date 1 borrowing and R be the net interest rate.
- (10 points) Suppose the agent can borrow and lend freely. Outline the maximization problem. If $\beta = 0.5$, $A = 2$, $q_1 = 2$, $k = 4$, $z = 1$, and $R = 0$. What is the date 1 borrowing b_1 to achieve the optimal consumption plan?
 - (10 points) Suppose the bank imposes a borrowing constraint $b_1 \leq \theta q_1 k$. If we observe that θ drops from 0.7 to 0.5, explain intuitively why θ may decline and solve for consumption c_1 and c_2 .
7. (Short-answer Questions) Answer the following questions in brief. Expect a deduction of points for unduly lengthy answer.
- (5 points, Business Cycles) Let $\hat{\sigma}_y^2$, $\hat{\sigma}_c^2$, and $\hat{\sigma}_i^2$ denote the sample variance of the detrended time-series data for real GDP, real consumption, and real investment. Compare their magnitudes in descending order. What is the implication of the above fact?
 - (5 points, Growth Accounting) Given the aggregate production function: $Y = AF(K, L)$, where Y , A , K , and L denote real output, TFP, capital, and labor, respectively. Describe how to perform a growth accounting exercise. Be clear about the assumptions you are making.

8. (Habit Formation) Consider a two-period model of consumption and savings where consumers have “habits”, meaning that they care about consumption relative to their own past consumption. Thus preferences are given by:

$$u(c_t) + \beta u(c_{t+1} - c_t),$$

where c_t denotes the consumption at time t . Suppose the consumers face a constant real interest rate r , and so face the constraints:

$$c_t + s_t = y_t,$$

$$c_{t+1} = y_{t+1} + (1+r)s_t,$$

where y_t and y_{t+1} are exogenous endowments at time t and $t + 1$, respectively. The term s_t denotes savings.

- (a) (10 points) Find the Euler equation linking c_t and c_{t+1} .
 (b) (10 points) Provide an interpretation of the Euler equation.

9. (Uncertainty) Consider a 2-period representative agent model, in which the representative household maximizes:

$$\max_{\{C_t, C_{t+1}\}} U(C_t) + \beta E_t[U(C_{t+1})],$$

subject to the constraints:

$$C_t + S_t = Y_t,$$

$$C_{t+1} = Y_{t+1} + (1+r)S_t,$$

where the utility function is

$$U(C) = C - \frac{k}{2}C^2,$$

r is the real interest rate (a constant), and $E_t[\cdot]$ refers to the conditional expectation. The term S_t denotes savings. Assume the parameter k is sufficiently small that marginal utility is always positive in both periods. The endowments Y_t and Y_{t+1} are random variables with joint probability distribution shown in Table 1. That is, for instance, $P(Y_t = 3, Y_{t+1} = 2) = 0.3$.

Table 1: Joint Distribution of Y_t and Y_{t+1}

	$Y_t = 3$	$Y_t = 2$
$Y_{t+1} = 2$	0.3	0.4
$Y_{t+1} = 4$	0.2	0.1

- (a) (10 points) Find the Euler equation linking C_t and C_{t+1} .
 (b) (10 points) Suppose that $Y_t = 3$ is known at time t , and a storage technology determines that $r = 0$. Also suppose that $\beta = 1$. Solve for C_t and C_{t+1} .