題號： 127
國立臺灣大學102學年度碩士班招生考試試題
科目：總體經濟學
題號：127
節次： 2
共 4 頁之第 1 頁

- 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。

1. (Short-answer Questions) Answer the following questions in brief. Expect a deduction of points for unduly lengthy answer.

   (a) (5 points) What is the difference between "Law of One Price" and "Purchasing Power Parity"?

   (b) (5 points) During 1990–2012, why do the official holdings of foreign exchange reserves by Taiwan's Central Bank rise sharply since 1998?

2. (New Keynesian Model and Monetary Policy) Consider the following simplified version of the New Keynesian model with intertemporal IS curve, New Keynesian Phillips curve, and monetary policy (Taylor rule):

$$x_t = E_t x_{t+1} - \theta(R_t - E_t \pi_{t+1}), \quad \theta > 0,$$
$$\pi_t = \beta E_t \pi_{t+1} + \lambda x_t + u_t, \quad 0 < \beta < 1, \ \lambda > 0,$$
$$R_t = \delta \pi_t, \quad \delta > 1,$$

where $x_t$, $R_t$, $\pi_t$, and $u_t$ represent the output gap, the nominal interest rate, the inflation rate, and the stochastic aggregate demand shock, respectively. $E_t(\cdot) = E(\cdot|\Omega_t)$ denotes the conditional expectation given information set $\Omega_t$. We further assume that $u_t$ follows a first-order autoregressive process

$$u_t = \rho u_{t-1} + \varepsilon_t, \quad 0 < \rho < 1, \quad \varepsilon_t \overset{i.i.d.}{\sim} (0, \sigma^2).$$

   (a) (10 points) Solve for $\pi_t$ and $x_t$ as functions of the exogenous shock, $u_t$. Determine the equilibrium response of $\pi_t$ (inflation), and $x_t$ (output gap) to a positive aggregate demand shock. That is, determine

$$\frac{\partial \pi_t}{\partial u_t} \gtreqless 0? \quad \text{and} \quad \frac{\partial x_t}{\partial u_t} \gtreqless 0?$$

   (b) Suppose that the central bank sets $\delta = \rho < 1$ (a passive monetary policy).

      i. (5 points) What will be the equilibrium levels of inflation and the output gap?

      ii. (5 points) Moreover, suppose that $\rho$ and $\beta$ are numbers close to 1, and $\rho\beta \longrightarrow 1$. What does this passive policy rule imply for the variability of inflation, $Var(\pi_t)$, and the variability of the output gap, $Var(x_t)$?

見背面

題號： 127
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節次： 2

國立臺灣大學102學年度碩士班招生考試試題

題號：127
共 4 頁之第 2 頁

(c) (5 points) Now suppose instead that $\delta$ is set to a very large positive constant, i.e., $\delta \longrightarrow \infty$ (an active monetary policy). What does this active policy rule imply for the variability of inflation and the variability of the output gap?

3. (Two-period Search Model and Unemployment) Consider a model in which an individual lives two periods. He starts off the first period unemployed, searches and receives a job offer for sure. In each period the worker receives a job offer of wage $w_1$ with probability $\eta$ and an offer of $w_2$ with probability $1-\eta$. If the individual accepts the offer, he will receive the same wage both in period 1 and period 2 without separation and termination. If the individual rejects the job, he gets an unemployment benefit of $b$, and will search again in period 2. Assume that

$$w_1 < b < w_2.$$

The worker seeks to maximize his discounted lifetime income:

$$y_1 + \beta E(y_2), \quad 0 < \beta < 1,$$

where $y_t$ is the income either from work or unemployment benefits, and $E(\cdot)$ refers to the expected value. Let the reservation wage be defined as the wage such that the individual is indifferent between accepting and rejecting an offer. Let $\bar{w}_1$ and $\bar{w}_2$ denote the reservation wages in periods 1 and 2, respectively.

(a) (5 points) Start with second period, and find $\bar{w}_2$.

(b) (5 points) Now consider the first period, and find $\bar{w}_1$.

(c) (5 points) Show that $\bar{w}_2 < \bar{w}_1$, i.e., the reservation wage decreases over time.

接次頁

4. (消費與勞動的跨期選擇及均衡分析) 考慮一個由政府及衆多消費者及廠商所組成的兩期模型，時間 $t = 1, 2$。三者的經濟活動分述如下。

政府：

政府針對民間消費 $c_1$ 及 $c_2$ 分別課以比率 $\tau_1$ 及 $\tau_2$ 的消費稅，全部稅收以定額方式移轉給消費者。假設政府無其他支出，因此各期政府預算滿足 $v_t = \tau_t c_t$，$v_t$ 爲定額移轉支付。

廠商：

廠商向消費者雇用勞動 $n_t$，生產同質且不能儲存的商品 $y_t$，其生產函數 $y_t = A_t f(n_t)$ 滿足 $f'(\cdot) > 0$，$f''(\cdot) < 0$，$A_t$ 是外生給定的生產衝擊。令 $w_t$ 表示實質工資率，則廠商利潤爲 $d_t = A_t f(n_t) - w_t n_t$。給定各期 $A_t$ 及 $w_t$，廠商選擇各期勞動以追求最大利潤，所有利潤均以股利方式分配給消費者，其選擇問題爲

$$\max_{\{n_t\}} \quad d_t = A_t f(n_t) - w_t n_t, \quad t = 1, 2。$$

消費者：

消費者擁有一單位的時間稟賦，分配於勞動 $n_t$ 及休閒 $l_t$，因此 $l_t + n_t = 1$。假設效用函數 $u(c_t, l_t)$ 滿足古典假設，消費及休閒同爲正常財。令 $b_1$ 表示第 1 期期末的實質債勞餘額，$r$ 表示實質利率。給定各期 $\{d_t, v_t, w_t, \tau_t\}$ 及實質利率水準 $r$，消費者的兩期選擇問題爲 (假設消費者無起始資產或負債，即 $b_0 = 0$。$\rho$ 爲時間偏好率)

$$\max_{\{c_t, l_t, n_t, b_t, t=1,2\}} \quad u(c_1, l_1) + \beta u(c_2, l_2), \quad \beta = 1/(1+\rho) \in (0,1),$$
$$\text{subject to} \quad l_1 + n_1 = 1, \quad l_2 + n_2 = 1,$$
$$(1+\tau_1)c_1 + b_1 = d_1 + v_1 + w_1 n_1,$$
$$(1+\tau_2)c_2 = d_2 + v_2 + w_2 n_2 + (1+r)b_1.$$

(1) (7 分) 請以直觀或數學方式推導消費者選擇問題的一階條件。消費者在消費 $c_t$ 與休閒 $l_t$ ($t = 1, 2$) 之間的取捨必須滿足哪一個條件？在本期消費 $c_1$ 與下期消費 $c_2$ 之間的取捨必須滿足哪一個條件？在本期休閒 $l_1$ 與下期休閒 $l_2$ 之間的取捨又必須滿足哪一個條件？請以直觀簡要說明。[提示：請勿將政府預算限制代入消費者的預算限制。]

(2) (5 分) 假設本期工資率 $w_1$ 上升，下期工資率 $w_2$ 不變。請根據題 (1) 的一階條件討論上述變動對消費者最適選擇 $\{c_1, c_2, n_1, n_2\}$ 的影響。[提示：對整體經濟而言，工資變動無財富效果。]

(3) (5 分) 假設消費者原來選擇 $b_1 < 0$。請根據題 (1) 的一階條件討論實質利率 $r$ 上升對消費者最適選擇 $\{c_1, c_2, n_1, n_2\}$ 的影響。

**見背面**

(4) (5 分) 假設本期稅率 $\tau_1$ 上升，下期稅率 $\tau_2$ 不變。請根據題 (1) 的一階條件討論上述變動對消費者最適選擇 $\{c_1, c_2, n_1, n_2\}$ 的影響。[提示：政府稅收等於移轉支付，故稅率變動無財富效果。]

(5) (7 分) 本題模型的全面均衡要求 (a) 廠商利潤極大，(b) 消費者效用極大，(c) 政府預算平衡及 (d) 市場供需平衡，包括商品市場 $c_t = y_t$ 及債券市場 $b_1 = 0$。假設起始的兩期稅率相等，即 $\tau_1 = \tau_2 = \tau$。令效用函數為 $u(c_t, l_t) = \ln c_t + \ln l_t$，生產函數為 $y_t = A_t n_t^\alpha, \alpha \in (0,1)$。請計算 $\{n_t, c_t, y_t, w_t, t = 1, 2\}$ 及實質利率 $r$ 的全面均衡解。[提示：全面均衡解是稅率及各期生產衝擊的函數。]

(6) (7 分) 假設本期的 $A_1$ 上升，未來的 $A_2$ 不變。請從全面均衡的角度簡要分析此一變動對本期消費 $c_1$，勞動 $n_1$，產出 $y_1$，實質工資率 $w_1$ 及實質利率 $r$ 的均衡效果。你的結論是否與題 (5) 的公式解一致？[提示：請至少考慮商品市場及勞動市場。未說明者不計分。]

(7) (7 分) 假設 $A_1$ 不變，但消費者預期 $A_2$ 上升。請從全面均衡的角度簡要分析此一變動對本期消費 $c_1$，勞動 $n_1$，產出 $y_1$，實質工資率 $w_1$ 及實質利率 $r$ 的均衡效果。你的結論是否與題 (5) 的公式解一致？[提示：未說明者不計分。]

(8) (7 分) 假設兩期稅率 $\tau_1$ 及 $\tau_2$ 等幅上升。請從全面均衡的角度簡要分析此一變動對本期消費 $c_1$，勞動 $n_1$，產出 $y_1$，實質工資率 $w_1$ 及實質利率 $r$ 的均衡效果。你的結論是否與題 (5) 的公式解一致？[提示：未說明者不計分。]

試題隨卷繳回