

考試科目	個體經濟理論	所別	財政學系	考試時間	5月26日 星期六	第一節
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國立政治大學圖書館

1. (a) Derive the Slutsky Equation for a utility maximizing consumer in a world of certainty. State your assumptions in the derivation.
 (b) Explain rigorously the economic meaning of the Slutsky Equation applied to *market* demand functions.
 (c) If all consumers in the market have homothetic preferences, what interesting properties can be found in the market Slutsky Equation?
 (d) In a world of uncertainty, for an expected utility maximizing consumer, what would be the meaning of a Slutsky Equation?
 (e) Explain the empirical relevance of the Slutsky Equation.
 (25 points)

2. "(The cost function of a firm summarizes all of the economically relevant aspects of its technology." (Hal Varian, *Microeconomic Analysis*, 3rd edition, 1992, p. 84)
 Comment on this statement. Detailed elaboration would help to receive higher grades.
 (25 points)

3. (25 points) Consider two firms which produce a homogeneous product with output levels y_1 and y_2 , and thus an aggregate output of $Y = y_1 + y_2$. The inverse demand function for the market is $p(Y) = a - bY$, where $a > 0$ and $b > 0$ are constants. They both produce this homogeneous product with a constant marginal cost c .
 (a) Find the Cournot equilibrium.
 (b) Find the Bertrand equilibrium.
 (c) Suppose that firm 1 determines its output level first. After observing firm 1's decision, firm 2 determines its output level. Find the Stackelberg equilibrium.

4. (25 points) A firm has a production function given by $f(x_1, x_2) = \min\{2x_1 + x_2, x_1 + 2x_2\}$. What is the cost function for this technology? What is the conditional demand function for factors 1 and 2 as a function of factor prices (w_1, w_2) and output y ?

備 考 試 題 隨 卷 繳 交

命 題 委 員 :

044 (簽章) 97年 5月12日

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考試科目	總體經濟理論	所別	財政系	考試時間	5月26日 星期六	第二節
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1. Consider the standard Solow model with no population growth, no technical progress, a consumption function of the form $c = (1-s)f(k)$, a constant savings rate s , a depreciation rate of δ and a Cobb-Douglas production function, $q = k^\alpha$. (All variables are expressed in per capita terms.) (a) Derive the expression for the steady state capital stock and steady state consumption in terms of the parameters α , s , and δ . (Solve out explicitly for k .) (b) Now, assume that agents maximize the present discounted value of the utility of consumption, $V_t = \int_0^\infty e^{-\theta(s-t)} u(c) ds$, where

$u(c) = -\frac{1}{\beta} e^{-\beta c}$ (constant absolute risk aversion). Show what the steady state capital stock and the steady state level of consumption are in this system in terms of α, β, δ and θ . (20分)

2. Consider the following supply and demand equations for a nonstorable good. Producers set the good's price at the end of the previous period based on their expected cost and expected demand. Producers then supply the amount of the good that consumers demand at the set price. The model is

$$(1) p_t = \alpha q_t^* + \beta x_t^*, \quad \text{where } p_t = \text{market price}$$

$$(2) q_t = \gamma p_t + \mu_t,$$

$q_t = \text{quantity demanded}$

$x_t = \text{per unit production cost, where}$

$$x_t = \rho x_{t-1} + v_t; \mu_t = \delta u_{t-1} + \varepsilon_t$$

All variables are in deviations from their means so all are mean zero. The white noise processes v_t and ε_t are mutually uncorrelated at all leads and lags. The AR parameters, ρ and δ , are restricted as $0 < \rho < 1$ and $0 \leq \delta < 1$. The expectational variables are defined as $q_t^* = E(q_t | I_{t-1})$ and $x_t^* = E(x_t | I_{t-1})$, where I_{t-1} contains values of p, q, x , and μ dated time $t-1$ and earlier. Suppose that a researcher tests the hypothesis that $\delta = 0$ by testing the significance of the OLS coefficient estimate from a regression of the OLS residuals from (2) on their lagged values. Briefly explain why this procedure is incorrect. (15分)

備 考 試 題 隨 卷 繳 交

命 題 委 員 :

045 (簽章) 2007年 5月 10日

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考試科目	總體經濟理論	所別	財政系	考試時間	5月26日 星期六	第二節
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國立政治大學圖書館

3. Consider the basic Ramsey model in which agents maximize lifetime utility

$$U = \int_0^{\infty} u(c_t) e^{-\theta t} dt \text{ subject to the budget constraint } \dot{k}_t = w_t + \gamma_t k_t - c_t - T_t$$

where k_t = capital stock

γ_t = rate of return on capital

T_t = lump sum taxes

w_t = labor income

c_t = consumption.

Population is assumed constant. Government spending, g_t , is financed by current taxes, $g_t = T_t$.

- Set up the Hamiltonian and derive the equations of motion for capital and consumption in this economy. (5分)
- Draw the proper phase diagram with k on the horizontal axis and c on the vertical axis. (5分)
- Assume the economy starts at a steady state with a particular level of government spending, g_0 . Depict the path taken to the new steady state when the level of government spending increases from g_0 to a higher level, g_1 . (5分)

備 考 試 題 隨 卷 繳 交

命題委員： 046 (簽章) 2007年5月10日

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考試科目	總體經濟理論	所別	財政學研究所 博士班	考試時間	5月26日 星期六	第二節
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國立政治大學圖書館

4. Suppose the augmented Phillips curve $\pi_t = 4 - U_t + \pi_t^e$, where π_t is the inflation rate for period t , U_t is the unemployment rate for period t , and π_t^e is the expected inflation rate for period t . (All variables are measured as percentages)

- A. What is the nature rate of unemployment? (5%)
- B. Suppose that expectations are formed in such a way that $\pi_t^e = \pi_{t-1}$. The current period is period 1, and $\pi_0 = 2$ is predetermined. If the government wants to eliminate all inflation in the current period and to maintain a zero inflation rate in all future periods, what unemployment rate is required for the current period and what will the unemployment rate be in future periods? (15%)
- C. Suppose again that $\pi_t^e = \pi_{t-1}$ and that $\pi_0 = 2$ is predetermined. Describe the evolution of inflation if the government tries to maintain an unemployment rate of 3% in the current and in future periods. Please calculate the values of $\pi_1, \pi_2, \pi_3, \pi_4$, and π_5 . (5%)

5. This problem deals with the basic growth theory model with a fixed savings rate. Assume that the production function is $Y = 3K^{1/3}L^{2/3}$ where Y represents output, K represents the capital stock, and L represents the input of labor. Capital accumulates according to $\dot{K} = I - \delta K$ where I is gross investment and δ is the depreciation rate. The population grows at the constant proportional rate n . Each person provides one unit of labor services and therefore $\dot{L} / L = n$.

- A. Suppose now that $n = 0.03$, that $\delta = 0.12$, and that the savings rate is $s = 0.20$. What is the steady state value of $k = K/L$? What is consumption per person in the steady state? (10%)
- B. If $n = 0.03$ and $\delta = 0.12$, what is the Golden Rule value of k ? What is the corresponding steady state consumption per person? What savings rate, s , gives rise to the Golden Rule? (15%)

備考	試題隨卷繳交
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命題委員	047 (簽章) 96年5月14日
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