

試科目	個體經濟學	所別	經濟	考試時間	月	日	上	午
					星期		下	

Microeconomic Theory

1. (20%) A two-part tariff scheme is a common way to price discriminate. First you are asked to show how the monopolist sets a two-part tariff when there is only one type of consumers. Then discuss how the monopolist applies this scheme when there are many different types of consumers in the market.

2. (15%) Given the following excess demand functions for three commodities

$$z_1 = 1 - p_1^2, \quad z_2 = -p_1 p_2, \quad \text{and} \quad z_3 = -p_1 p_3 \quad \text{on the unit sphere}$$

$$p_1^2 + p_2^2 + p_3^2 = 1.$$

(a) Is Walras' law satisfied?

(b) Determine whether the price adjustment mechanism $\frac{dp_i}{dt} = z_i(p)$ converges to the equilibrium price vector p^* .

3. (15%) Core theory has mainly been employed in the theory of general equilibrium. In fact, core theory is highly flexible way of looking at practical economic problems. You are asked to explain the principle of the core, and then illustrate how useful is the core theory in economics.

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4. (15%) Given the production function $f(X_1, X_2) = a_1 \ln X_1 + a_2 \ln X_2$, calculate the profit-maximizing demand and supply functions, and the profit function. (For simplicity assume an interior solution. Assume that $a_1 > 0$.)
5. (15%) Person A has a utility function of $U_A(X_1, X_2) = X_1 + X_2$ and person B has a utility function $U_B(X_1, X_2) = \max(X_1, X_2)$.
- Illustrate this situation in an Edgeworth box diagram.
 - What is the equilibrium relationship between P_1 and P_2 ?
 - What is the equilibrium allocation?
6. (20%) Suppose that there are two goods, X_1 and X_2 . Let the price of good 1 be denoted by P_1 and set the price of good 2 equal to 1. Let income be denoted by Y . A consumer's demand for good 1 is given by $X_1 = 10 - P_1$.
- What is the demand function for good 2?
 - What equation would you solve to calculate the income compensation function that would generate these demand functions?
 - What is the income compensation function associated with these demand functions?

1. 消費理論可以分為那兩大系統？当期所得、永久所得、及
 財富之用的關係為何？永久所得如何估計？根據財富消
 費理論，永久性所得時性所得，何者對消費需求的影响
 影响較大？兩者的所得乘數效果有何不同？(25分)

2. 設人口成長率為 n ，儲蓄率為 s ，生產函數為固定規模

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報及兩冊：

1. 導引 Solow 成長模型的基本方程式，並說明其涵意
2. 在穩定狀態下，每人資本存量有何特性？
3. 在什麼情況下，穩定狀態均係穩定或不穩定的？
4. 穩定狀態的產出成長率？儲蓄率有何關係？儲蓄率
在成長過程中的重要嗎？
5. 定義儲蓄率，並以圖形表示之。(25分)

3. Let a classical model as follows:

$$EDG(P, r) \equiv y^d - y^* = c^d(z^*, \frac{M}{P} + \frac{KB}{rP} + \frac{RK}{r}) + \lambda^d(r) + g - y^*,$$

$$EDF(P, r) \equiv \dot{f}^d - \dot{f}^s = f^d(z, z^*, y^*, r, \frac{M}{P} + \frac{KB}{rP} + \frac{RK}{r}) - \dot{e}^s(r) - \dot{b}^s,$$

$$EDM(P, r) \equiv \dot{m}^d - \dot{m}^s = \dot{m}^d(y^*, r, \frac{M}{P}, \frac{M}{P} + \frac{KB}{rP} + \frac{RK}{r}) - \dot{m}^s.$$

Set the dynamic adjustment of r and P as:

$$\frac{dP}{dt} = R_1 [EDG(P, r)], \quad \frac{dr}{dt} = -R_2 [EDF(P, r)].$$

Try to find in what condition will make this dynamic system stable? (2)

There is a perfect foresight open economic model as follows:

$$\dot{P} = \pi [v + \gamma \bar{y} - \sigma r + \delta(e - P) - \bar{y}], \quad 1 > \gamma > 0, \sigma > 0, \delta > 0, \quad (1)$$

$$\dot{m} - P = -\lambda r + \phi \bar{y}, \quad \lambda > 0, \phi > 0, \quad (2)$$

$$r = r^* + e, \quad (3)$$

where r and r^* are domestic and foreign interest rates, v is automatic expenditure of aggregate demand, \bar{y} is full employment's output, and e is exchange rate.

Try to use the characteristic roots and saddle point paths to analyze how about the model's dynamic properties. Try to use this diagram to see whether the exchange rate does overshooting in the short-run if a unanticipated money supply increasing. (25%)

有三家 PC 廠 (A, B, C) 欲估計其產品之價格彈性, 現已知

$$Q_{it} = f(P_A, P_B, P_C, Y)_t + \varepsilon_{it} \quad (i = A, B, C), \quad t = 1 \dots T$$

請問應如何估算? (註: $(Q_{it}, P_A, P_B, P_C, Y)_t$ 均為已知資料
 Y 為所得, 均已取對數, (public informat

寫出下列:

- ① 列出模型及必要假設
- ② 估計式
- ③ 檢定假設
- ④ 經濟涵義

2. 有一產出函数 $Q = f(x)$, $x = [x_1, x_2]$ 為其要素, $f(\cdot)$ 為非直線型函数。

請寫出 ① 成本函数 (translog form) 之形式

- ② 如何加上限制條件?
- ③ 略說明應如何估計?

3. 有二時間序列 $\{x_t\}$ $\{y_t\}$ 分別為 i.i.d. (individually independent distributed), 請問

- ① 如何找出兩者之因果關係 (Granger causality)?
- ② 如何檢測是否為恆定 (stationary) 序列?
- ③ 如何找出兩者之間有無長期之均衡關係?
- ④ 若兩者可以 ARCH(1) 之模型表示.

$$\begin{cases} y_t = \beta' x_t + \varepsilon_t \\ \varepsilon_t = u_t \sqrt{\alpha_0 + \alpha_1 \varepsilon_{t-1}^2} \end{cases}$$

則應如何估計 β' ? (略述即可)

- 4.
- 1) (10%) Heteroskedasticity in the errors leads to biased estimates of the regression coefficients and their standard errors. True or false? Explain.
 - 2) (10%) The Durbin-Watson test for serial correlation is not applicable if the errors are lagged dependent variables as explanatory variables. True or false? Explain.
 - 3) (10%) In multiple regression, a high correlation in the sample among the regressors implies that the least squares estimators of the coefficients are biased. True or false? Explain.
 - 4) (20%) Consider a model with a zero-one dependent variable. You have a multiple regression program and a program for the logit and probit models. You have computed the coefficients of the linear probability model and the logit and probit models:
 - (a) How will you transform the coefficients of the three models so that they are comparable?
 - (b) How will you compute the R-squares for the three models?
 - (c) By what criteria will you choose the best model?