ECON 439/539 | OREGON STATE UNIVERSITY | Winter 2008
Public Policy Analysis | Department of Economics | C. Tremblay

Midterm Exam

Instructions: This exam has 7 questions and is worth 120 points. Point values for each question are indicated to the right of the question number. Calculators, notes and books are not allowed. Be sure to define your terms, and to label all axes and curves in graphs. Good luck.

1. (15 points) Evaluate the following statement: There is no need for government intervention in a free market economy.

The statement is not true for 2 main reasons:

1. Market failure
2. Equity considerations

The market fails to achieve efficiency when one or more of the following conditions exist;

1. Monopoly power
2. Imperfect information (or nonexistence of markets)
3. Externalities
4. Public goods

It would be extremely rare for the market to produce the "equitable" allocation of resources. The government can reallocate income to promote equity.

2. (15 points)

a. What is the condition for efficiency in exchange? Provide definitions for the term(s) that you use.

b. Is the condition met in perfect competition? Why or why not?

a. The condition is $MRS_A = MRS_B$ where MRS_i = marginal rate of substitution for individual i, $i = A, B$.
MRS_i = amount of good x that i is willing to trade for 1 more unit of good y [holding utility constant]

b. Yes. When individuals maximize their utility subject to their budget constraints, as in perfect competition,

$$MRS = \frac{P_x}{P_y} \quad \text{where } P_j = \text{price of good } j,\ j = A, B$$

For Ann (A), $MRS_A = \frac{P_x}{P_y}$

For Bob (B), $MRS_B = \frac{P_x}{P_y}$

Since prices of x and y are the same for A + B,

$$MRS_A = \frac{P_x}{P_y} = MRS_B$$

3. (16 points)

6 a. Consider the hypothetical question, how does X affect Y, where X and Y are variables of interest. Write down a regression equation that could be used to estimate the effect of X on Y.

5 b. Formulate a question of the form: how does X affect Y. That is, fill in the blanks:

How does _____ affect _____?

5 c. Would it be most appropriate to use ordinary least squares regression, binary logit, multinomial logit, or Poisson regression to estimate your model?

be more precise in Econ 424/529

a. $y = \beta_0 + \beta_1 X$ $\quad y = b_0 + b_1 X$

b. How does flying time affect probability of being hired by an airline (binary logit)

tariffs affect FDI
exercise
studying
land-lockedness
house size
employer-offered insurance

life expectancy
test scores
FDI
house price
employee retention
- average tenure - OLS
- probability a worker leaves in a given time period - binary logit

} OLS

4. (21 points) Suppose that you are asked to conduct a cost-benefit analysis in order to advise the governor about whether or not to build a new prison. Explain how you would conduct the cost-benefit study step by step.

5 (1) Determine costs

(3) - Construction - 1 time cost (C1)

(2) - Maintenance, wages, other operating costs (C2)
long-term + must be discounted (see below)

5 (2) Determine benefits (B)

(3) - Crime reduction

(2) Expected value of averted crime costs
= probability of committing a crime if not in prison
× average cost of a crime
× number of criminals who would be housed in the prison

6 (3) Calculate present value of expected net benefits

$$PVNB = \sum_{t=1}^{T} \frac{(B_t - C2_t)}{(1+r)^t} - C1$$

where r = rate of discount, usually 0.04 or T-bill rate

t = 1, 2, ... T where T is the expected life of the prison

5 (4) IF PVNB > 0 (or is high relative to other public projects) then the prison should be built.

5. (12 points) Briefly discuss 3 criticisms of the idea of social welfare maximization as a method of attaining social goals as presented in the readings from Katz and Rosen.

(Any 3)

1. Maximizing individuals happiness may not be an appropriate social goal →
2. Other social goals may be more important e.g. glorification of God, max power of the state
3. Welfare max ignores means to the ends of resource allocation. How was the allocation determined? e.g., process democratic?
4. Preferences may be corrupted by advertising and do not truly reflect utility.

Also:

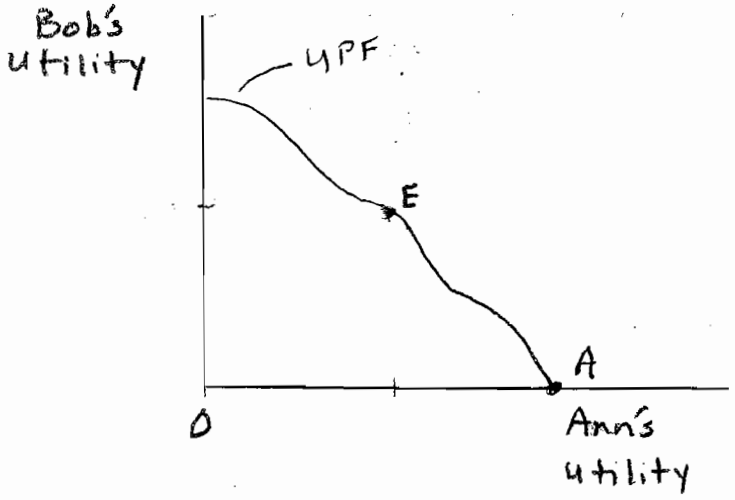
5. Cannot measure utility (make interpersonal comparisons)
6. Society must decide on how to value the deservedness of each individual.

6. (20 points)
   a. Define Pareto efficiency.
   b. State the utilitarian view of equity.
   c. Is a Pareto efficient allocation equitable when equity is defined according to the utilitarian view? Use a utility possibilities frontier to illustrate your response.

a. Pareto efficiency - An efficient or Pareto efficient allocation of goods is an allocation in which no one can be made better off without making someone else worse off.

b. Utilitarian view weights utility of all individuals equally [or; maximizes the total utility of all members of society]

c. Not necessarily. The graph below shows the utility possibilities frontier (UPF) which maps all efficient allocations of resources in terms of utility levels of 2 individuals. [The equitable allocation in the utilitarian view is only at 1 point (perhaps E)] - not covered in class, whereas Pareto efficient allocations occur at any point on the UPF, such as point A.

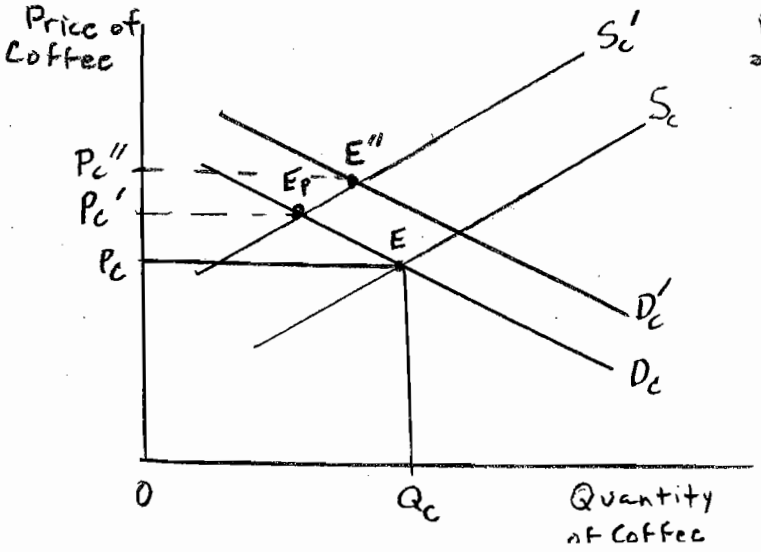


7. (21 points) Construct a supply and demand model of 2 interrelated markets for the substitute goods coffee and tea. Suppose that a tax is imposed on coffee. Would a partial equilibrium model overstate or understate the effect of the tax on the price of coffee? Illustrate your answer graphically.

In the graphs below, the coffee market is at point E before the tax, with price P_c and quantity Q_c. The tax causes a decrease in the supply of coffee, and the supply curve shifts from S_c to S_c'. Price increases to P_c' which is the partial equilibrium price. (E_p is the partial equilibrium point.)

The higher price of coffee induces an increase in demand in the market for the substitute good, tea, from D_T to D_T'. The price of tea increases, which increases the demand for coffee from D_c to D_c' and the price of coffee from P_c' to P_c''. The feedback effects will continue and will become smaller which each round of adjustment. The price of coffee will rise in each round. Therefore, the partial equilibrium price, P_c', will <u>understate</u> the effect of the tax on the price of coffee.

Coffee Market



Tea Market