

Study Guide for the Midterm

Course Outline, Readings, and Objectives

Part 1 – The Role of Public Policy

1.1 Introduction

1.2 Efficiency and Equity – Welfare Economics

1.2.1 *Equilibrium and Efficiency*

▸ Katz, Michael L. and Harvey S. Rosen, *Microeconomics*, Second Edition, Burr Ridge, Ill.: Irwin, 1994, pp. 377-385.

▸ Pindyck, Robert S. and Daniel L. Rubinfeld, *Microeconomics*, Sixth edition, Upper Saddle River, NJ: Pearson Prentice Hall, 2005, pp. 579-584, 590, 604-606.

Partial Equilibrium

- Define consumer surplus, producer surplus, and total surplus verbally and graphically.
- Explain and show graphically why total surplus is maximized in perfect competition.
- Show how consumer surplus, producer surplus, and total surplus change when price controls are imposed.
- Define deadweight loss and show graphically.
- Explain why society might impose rent control laws even if total surplus falls.
- Show how a rent control policy can actually reduce consumer surplus.
- Illustrate how a federal tax on a good would affect total surplus.
- Define excess burden.

General Equilibrium

Note: PowerPoint slides for the lectures are posted on my website for this topic.

- Define partial equilibrium analysis and general equilibrium analysis.
- Construct a supply and demand model of 2 interrelated markets (i.e., where the goods are complements, goods are substitutes, or 1 good is an input in the production of the other good). Show how a partial equilibrium model

understates the effects of a change in price or quantity in one market when there are feedback effects from a related market.

- Explain when a General Equilibrium occurs.
- Define a Pareto efficient allocation.
- State the first and second theorems of welfare economics.
- Define Marginal Rate of Substitution (MRS), Marginal Rate of Technical Substitution (MRTS), and Marginal Rate of Transformation (MRT).
- List the 3 conditions needed for economic efficiency.
- Describe the equalities that must hold for each of the following types of efficiency:
 - Efficiency in exchange.
 - Efficiency in production.
 - Efficiency in the output market.
- Why do competitive markets satisfy the 3 conditions of efficiency? Use equalities to show your answer.
- Suppose that the MRTS for good $x = 2$ and the MRTS for good $y = 3$. Should society change the amount of x produced and the amount of y produced? If so, how?
- Recall that marginal cost (MC) is the additional cost for producing 1 more unit of output. What is the relationship between marginal cost and MRT?
- Explain why an allocation of goods is efficient only if the goods are distributed so that the MRS between any pair of goods is the same for all consumers.

1.2.2 *Equity*

- Katz and Rosen, pp. 422-426.
- Pindyck and Rubinfeld, pp. 591-593.

- Using a utility possibilities frontier, illustrate that: 1) an efficient allocation need not be equitable; 2) an inefficient allocation may be more equitable than an efficient allocation.
- Define a social welfare function verbally and in equation form.
- State 4 views of equity.
- Critique the idea of social welfare maximization as a method of attaining social goals.

1.3 When Should the Government Intervene?

- Pindyck and Rubinfeld, pp. 607-610.

- Briefly discuss 4 situations in which free markets are not efficient.
- Explain why monopoly power violates the conditions of economic efficiency.
- How does the second welfare theorem relate to government intervention?

Part 2 – Tools of Analysis

2.1 Cost-Benefit Analysis

▸ Santerre, Rexford E. and Stephen P. Neun, *Health Economics: Theories, Insights, and Industry Studies*, Chapter 5: Cost-Benefit Analysis, Chicago: Irwin, 1996.

Note: PowerPoint slides for the lectures are posted on my website for this topic.

- Define cost-benefit analysis (CBA).
- Give an example of an application of CBA.
- Show graphically the social welfare-maximizing level of output (Q^*) of a publicly-provided good or service. Be sure to label axes, curves, and Q^* .
- Write the equation for expected value. When is it necessary to use expected values?
- Write the equation for the present value of net benefits.
- Explain why present values are used in cost-benefit analyses.
- Calculate the present value of a project.
- Identify the impact of an increase in the value of the discount rate on present value of net benefits, when costs are incurred in the first period and benefits accrue over a long period of time.
- Explain how the value of human life is assessed using the human capital approach.
- Evaluate the human capital approach for valuing life.
- Describe how earnings in dangerous occupations can be used to infer values of life.
- Using equations show how the value of life can be estimated from consumers' willingness-to-pay for safety devices.
- Evaluate the willingness-to-pay approach for valuing life.

[See also question at the end of this study guide.]

2.2 Introduction to Regression Analysis

▸ Wooldridge, Jeffrey M., *Introductory Econometrics*, South-Western, 2000, Chapter 1.

▸ Stock James H. And Mark W. Watson, *Introduction to Econometrics*, Brief Edition, Boston: Pearson, 2008, pp. 109-119.

- Write down a regression equation that can be used to estimate the impact of a variable, X , on a dependent variable, Y .
- Explain the meaning of an estimated coefficient on the X variable.
- Show graphically a scatter plot of data with the regression line imposed.
- Predict the value of Y for a given value of X , given the least-squares estimated parameters.

- What is the nature of the Y variable when the appropriate estimation technique is probit or logit?
- What is the difference between (binomial) logit and multinomial logit?
- Define the marginal effect of X on Y, in general.
- What is the difference between cross-section, time series, pooled and panel data?

Student Presentations

The material presented in the oral presentations is covered on the exams. PowerPoint slides are posted on my webpage. Here are some types of questions that may appear on the exam.

- Choose a presentation, other than your own, and discuss the article presented thoroughly. Discuss the following issues:
 - **Primary question(s)** addressed in the paper
 - **Method** used to analyze the question
 - **Data** source used in the article, if relevant
 - **Results**, focusing on the implications for the primary question(s)
 - **Policy** implications.
- For 3 presentations of your choice, other than your own, summarize the question and main results of the paper.

Question on Cost-Benefit Analysis from Prior Exam

Question

Suppose that a program is proposed to provide pre-natal care to pregnant women who are on public assistance. Physicians have established that some babies born to women who have not had proper care have health problems at birth and throughout their lives. Advocates of the proposal claim that it will actually reduce public expenditures because medical expenses for the child, which would likely be publically financed, will be averted. Explain step by step how you would use cost-benefit analysis to assess whether or not the proposed program should be undertaken.

Answer

A proposal should be undertaken if the present value of expected net benefits (benefits - costs) exceed zero (or rank highly compared to other public projects).

Step 1: Determine costs

The costs include the cost of pre-natal care (CP).

Step 2: Determine benefits

a. Expected value of averted health care costs

The benefits are averted health care costs for the lifetime of the child.

Averted health care costs = $EVP - EVNP$ where

EVP = expected value of the costs of an unhealthy baby if the mother did receive pre-natal care, and

$EVNP$ = expected value of the costs of an unhealthy baby if the mother did not receive pre-natal care

Let PP = probability that a baby is unhealthy, given that the mother had pre-natal care

PNP = probability that a baby is unhealthy, given that the mother did not have pre-natal care, and

C = lifetime medical costs for an unhealthy baby

Then $EVP = PP * C$, $EVNP = PNP * C$, and

Expected benefits of averted costs = $EVNP - EVP$.

b. Present value of expected benefits

The benefits (or averted costs) of pre-natal care accrue over the child's lifetime. Thus, present values must be used to evaluate costs and benefits in today's dollars. The present value of the expected benefits = $(EVNP - EVP)/(1+r)^t$ where $t = 1, \dots, T$, T is the expected years of life, and r is the discount rate, generally estimated by 0.04 or the prevailing interest rate. (Since pre-natal care lasts less than a year, it is not necessary to put these costs in present value terms.)

Step 3: Compare present value of expected benefits and costs

If $(EVNP - EVP)/(1+r)^t > CP$ then the program should be funded.