Economics 7550 Final Exam  
Fall 2001  
Dr. Goodman  
December 19, 2001  

This examination has 7 questions. You are required to do all 7 questions, and you will have up to 2.5 hours to do them. Each question has equal weight, and each part of each question has equal weight so you must allocate your time accordingly. Set up each problem as carefully as you can, and show the steps to solution if you cannot actually solve it in the short time that the test takes.

I am unlikely to give any help during the exam unless a question is clearly misleading, so you should make clarifying assumptions and proceed with your analysis. Any incidents of cheating will result in a 0 on the exam. Good luck!

1. Suppose that Abner’s and Belinda’s utility functions are summarized by:

\[ U_A = G^{0.25}M^{0.75}, \text{ and} \]
\[ U_B = G^{0.75}M^{0.25}, \]

Where \( G = \) Consumer goods; \( M = \) Medical goods.

Suppose the economy has 100 units of \( G \) and 100 units of \( M \), and both Abner and Belinda are given 50 units of each.

a. Briefly sketch out an Edgeworth Box analysis of the problem as set up.

b. Is this an economically equitable allocation of resources? Why or why not?

c. Is this an economically efficient allocation of resources? Why or why not? Give as much detail as necessary, but you need not solve explicitly for the efficient allocation.

d. What does this problem say about equity and efficiency trade-offs?

2. This problem looks at regulatory issues.

a. In brief, what are DRGs and how do they work?

b. Describe in brief why monopolies lead to inefficient quantities of services provided to the consumers.

c. Show how consultant’s time and resources are modeled for a monopolist who may be seeking to reduce its production costs.

d. Sketch out the original and the new equilibria under Schleifer’s “yardstick competition” model.
3. Consider a cross-country analysis of health production $Q$ that is specified:

$$
\ln Q = a + b_1 \ln X_1 + b_2 \ln X_2 + c_1 \ln X_1^2 + c_2 \ln X_2^2 + e \ln X_1 \ln X_2
$$

a. Calculate the marginal product of input $X_2$.

b. How would you test the hypothesis that a Cobb-Douglas production function is the “true” production function among countries?

c. If you know the costs per unit of factors $X_1$ and $X_2$, and you cannot increase your total budget how would you decide whether to increase or decrease $X_1$?

d. Discuss briefly how you would test for economies of scale in the production of $Q$.

4. Consider the following diagram of supply and demand for health care in an economy.

![Supply and Demand Diagram]

a. Calculate the equilibrium expenditures in the economy.

b. Suppose that a 50% coinsurance rate is imposed. Calculate the new equilibrium quantity, price, and total expenditures.

c. Calculate the “welfare loss” that occurs due to moral hazard.

d. Discuss briefly both the demand and the supply losses engendered by the moral hazard.
5. Consider a cross-country analysis of health care expenditures using the form:

\[ E = a + b \cdot y + c \cdot p. \]

where:

- \( E \) = Expenditures/person
- \( y \) = Income/person
- \( p \) = price/unit health care.

You wish to evaluate your terms at the variable means \( \bar{E}, \bar{y}, \text{and} \bar{p} \).

a. Calculate the price elasticity of demand for expenditures.

b. If the income elasticity of demand exceeds 1, what will happen to the share of income going to health care?

c. When calculating income elasticities using the equation above, if the elasticity at the means is 1.25, what happens to it as variable \( y \) increases? Justify your answer.

d. What has been the general set of findings for income elasticities estimated with cross-country analyses? Interpret this finding.

6. Consider technological change as applied to the health care sector.

a. Give one example of unambiguously cost-decreasing technological change. Give one example that is unambiguously cost-increasing. Describe each briefly.

b. If \( \Delta h \) is improvement in health, and \( \Delta m \) is change in medical expenditures, then indicate the unambiguously cost-decreasing and cost-increasing technological changes in the diagram above.

c. Using the diagram above, briefly sketch out Goddeeris’s model that indicates how fractional coinsurance may bias technological change toward cost-increasing change.

d. Explain how technological change may affect health treatment episodes, and (indirectly) the measurement of health care costs.
7. Consider the paper that you presented in class.
   a. In a sentence or two, discuss the main findings.
   b. What would you view as the strengths of the approach that was used?
   c. What would you view as the weaknesses of the approach that was used?
   d. If you had unlimited resources and brilliant research assistants, how would you improve the analysis?