

Economics 737.01  
Spring 2011  
Final Exam

This exam is due (either e-mail or hard copy) by 11:59 PM on Monday, May 2. You may consult your notes and readings but NOT your classmates. There are 165 total points.

1. Consider Newhouse's (1977) model for analyzing cross-country variation in health expenditures:

$$HE_i = \beta_0 + \beta_1 GDP_i + \varepsilon_i$$

Where  $HE_i$  and  $GDP_i$  represent the per capita health expenditures and GDP of country  $i$ . The model is estimated using a cross section of data from 13 countries in 1971. He estimated an income elasticity of health expenditures of greater than 1.

- a) What was the  $R^2$  in this regression? Why is this important? (3 points)
- b) Do you believe that the estimator  $\hat{\beta}_1$  reflects the causal effect of GDP on health expenditures? Why/why not? (3 points)
- c) Gerdtham (1992) estimated the effect of GDP on health expenditures using panel data from 22 countries spanning 1972-1987. His model included country and year fixed effects and controls for inflation, the fraction of public financing in the health care system, and the fraction of the population over age 65. He estimated an income elasticity of 0.74. Do you think his estimated effect of GDP on health expenditures is more credible than Newhouse's? Why/why not? (3 points)
- d) Why is it important whether or not the income elasticity of  $HE$  is greater than 1? (2 points)

2. a) How might incomplete information (in the market for physician services) help to explain why medical expenditures are so high? Your answer should include a discussion of irreducible uncertainty, the principal-agent problem, and unobservable physician quality. (6 points)

b) Describe the target income hypothesis as it relates to the supply of physician services. (2 points)

c) Give short definitions of the following forms of physician compensation: fee-for-service, capitation, salary, and pay-for-performance. (8 points)

d) Why do capitation and salary provide less of an incentive to provide excessive care than fee-for-service? (3 points)

e) A "pay-for-performance" system has been argued to be the ideal, but discuss why implementing such a system is difficult. (2 points)

3. a) Discuss the two general types of empirical tests typically done to test for induced demand. For each, explain the logic behind the test but also name one problem. (8 points)

b) Explain why the findings of Gruber and Owings (1996) provide evidence of induced demand. (3 points)

c) Explain why the findings of Rice (1983) provide evidence of induced demand. (3 points)

4. a) What three conditions must be met in order for plaintiffs to show that they were the victims of medical malpractice? (3 points)
- b) Discuss what is wrong with the following statement: “Physicians are afraid of lawsuits because they could be devastating financially.” (2 points)
- c) Describe the difference between defining liability using the learned hand rule and a deviation from the “customary” level of care. Why would the latter lead to excessive care in a health care system with induced demand and third-party payers? (6 points)
- d) If malpractice lawsuits have no deterrent effect, which system of reimbursing victims is more efficient: a liability system, or a system of first-party insurance? Why? (3 points)
5. a) What is wrong with the statement “Not-for-profit hospitals are not allowed to earn a profit.” (2 points)
- b) Do YOU think hospitals provide public goods? Why does it matter? (3 points)
- c) The utility function in Newhouse’s (1970) model of non-profit hospitals is  $U = U(X, Y, \pi)$ , where  $X$ =output,  $Y$ =quality, and  $\pi$ =profit. Why does he add  $X$  and  $Y$  to the utility function and not simply model utility as a function of profit? (2 points)
- d) What is cost-shifting (in hospitals)? What are the two conditions that must be met for cost-shifting to be possible? Why do these conditions imply that cost-shifting is more likely in non-profit than for-profit hospitals? Why do these conditions imply that cost-shifting is less likely in an era of managed care? (8 points)
6. a) What is a certificate of need (CON) law? Give one reason why we might expect CON laws to increase costs and one reason we might expect them to reduce costs. (6 points)

Suppose (following much of the literature) we try to estimate the effect of state CON laws on costs using hospital-level panel data and the following regression equation:

$$COST_{ist} = \beta_0 + \beta_1 CON_{st} + \beta_2 \mathbf{X}_{ist} + \alpha_i + \tau_t + \varepsilon_{ist}$$

Where  $COST_{ist}$  is either the cost per inpatient day or the cost per admission in hospital  $i$  in state  $s$  in year  $t$ ,  $CON_{st}$  is a dummy variable equal to 1 if state  $s$  had a CON law in year  $t$ ,  $\mathbf{X}$  is a set of hospital-level controls, and  $\alpha_i$  and  $\tau_t$  represent hospital and year fixed effects.

- b) Under what assumption is  $\beta_1$  an unbiased estimator of the effect of having a CON law on costs? Do you think this assumption is valid? Why/why not? (5 points)
- c) What are the three different cost measures used in the literature? Why is using all of them, rather than relying on just cost measure, important? (5 points)

7. Suppose two hospitals compete with each other for patients. A new MRI machine is developed that is more convenient for patients. The machine costs \$2 million. If neither hospital purchases the machine or if both purchase it, there will be no changes in market shares. If one hospital purchases the machine and the other does not, the one that purchases it will steal \$7 million of business from the one that does not.

a) Draw a game box depicting this situation. (4 points)

b) What is the Nash Equilibrium? (2 points)

c) If the hospitals could collude and enter into an enforceable agreement, which outcome would they choose? (2 points)

d) How does this example illustrate why hospital competition could actually increase costs? (2 points)

e) What is the name for this phenomenon? (1 point)

f) Theoretically, is it more likely that competition increased costs in the older era of cost-based reimbursement, or the modern era of private managed care and Medicare prospective payment? Explain. (3 points)

8. a) Based on the description of ambulatory surgery centers (ASCs) from class, why do you suppose colonoscopies, endoscopies, cataract removals, prostate biopsies, and arthroscopies are the procedures most commonly performed at ASCs rather than hospitals? (3 points)

b) Broadly speaking, what are the two ways in which physicians can sort patients between ASCs and hospitals? Which of these would you expect to enhance social welfare, and which would you expect to reduce it? (6 points)

c) Some evidence suggests that ASCs increase the volume of procedures performed. Give one argument why these additional procedures might be welfare-improving and one argument why they might be wasteful. (4 points)

9. a) Describe one way in which the market for long-term care differs from the market for other medical services, and discuss the theoretical implications of this difference. (4 points)

b) Explain the argument made in the literature that raising the Medicaid reimbursement rate could actually reduce quality in nursing homes. (3 points)

c) The percentage of elderly with long-term care insurance is strikingly small (~10%). Describe Brown and Finkelstein's (2008) argument that Medicaid crowd out could explain the small size of this market. (3 points)

10. a) The *Handbook of Health Economics* argues that "mental health economics is like economics only more so" (p. 895). Describe three of the six specific reasons given in the lecture notes for why this is the case. (9 points)

b) What is a mental health "carve out"? (2 points)

11. a) What is wrong or misleading about the following statement: “Drug companies’ profits are extraordinarily excessive. It only costs a few cents to manufacture a pill that may sell for several dollars.” Involve the terms price, marginal cost, average cost, and fixed cost in your answer. (4 points)
- b) The price of brand name drugs often rises after generic competitors enter. What explanation does the literature offer for this seemingly paradoxical behavior? (3 points)
- c) Give one reason why direct to consumer drug advertising might improve social welfare, and one reason why it might hurt welfare. (4 points)

12. Suppose there are five available treatments for a particular condition. We can adopt one – and only one – as the “preferred” treatment. The total costs and QALYs gained from adopting each treatment are given in the table below:

Treatment	Total QALYs Gained	Total Costs
A	200	\$1,500,000
B	300	\$6,000,000
C	700	\$5,000,000
D	1000	\$10,000,000
E	1500	\$25,000,000

Answer the following questions by conducting an incremental cost-effectiveness analysis with a threshold of acceptability of \$25,000 per QALY. Show your work.

- a) Which, if any, of the treatments can be eliminated by strict dominance? (3 points)
- b) Which, if any, of the treatments can be eliminated by extended dominance? (3 points)
- c) Which treatment, if any, will ultimately be chosen? (3 points)

13. a) In your opinion (answers may vary), is the rise in health care costs primarily the result of market forces, market failures, or an interaction between the two? Explain. (3 points)
- b) Argue with the following statement: The 2010 Affordable Care Act focused more heavily on coverage than cost control – this shows the Democrats and their advisors do not understand the severity of the problem of rising health care costs. (3 points)