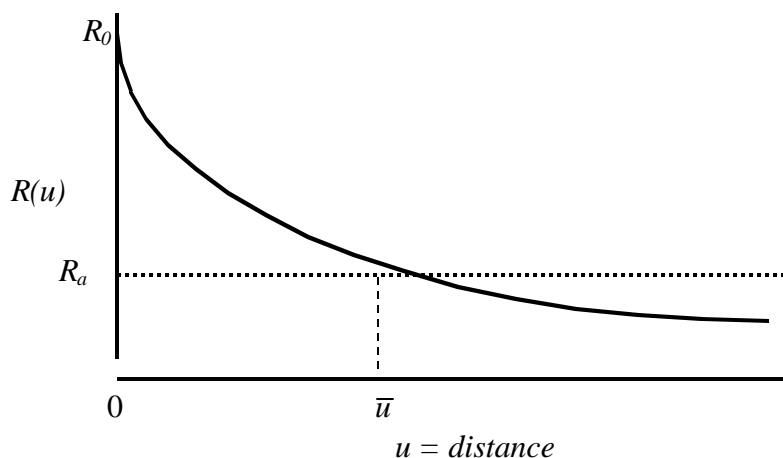


Economics 7800 – Exam Answers
December 20, 2000
Final Exam

Please answer each question in as much detail as necessary to provide a complete answer, but without gratuitous padding. You are to choose 3 of the first 4 questions and you MUST do question 5. You will have no more than 1 hour 40 minutes to finish the exam. Each problem has the same value and each part of each problem has the same value, so allocate your time accordingly. Good luck.

1. Consider land rents in an urban area such that: (12.5 points per part)



Use the above diagram to aid your analyses. Let R_a equal the agricultural rent, such that \bar{u} is the edge of the city. R_0 is the rent in the Central Business District.

- a. Assume an open city, and let \bar{u} equal 12. Suppose that there is an amenity that occurs at various levels throughout the city. Let the amenity increase only at $u = 4$. Using Lind's analysis, discuss what will happen to levels of utility and to land rents throughout the city.

Key point: $A' - A = \sum \Delta s + \sum \Delta p$, where s = surpluses and p = prices. With an open city Δs is 0, since s is constant (although not necessarily 0). As a result, at $u = 4$, prices and amenities rise. Prices don't change elsewhere, because everyone is at the margin.

- b. Assume, now, a closed city and let \bar{u} equal 12. Suppose again that there is an amenity that occurs at various levels throughout the city. Let the amenity increase at all distances greater than $u = 4$. Using Polinsky and Shavell's analysis, what will happen to the utility levels of the population? What will happen to land rents at various locations, and to aggregate (the sum of all of the) land rents in the city?

Key point: Look at V function, where $V = V(p(u), y - T(u), a(u))$. City is closed, so it is likely that V will increase. Where $a \uparrow$, rents will not rise to take away all of the surplus. Where a does not rise, rents must \downarrow .

c. Briefly compare Lind's analytical methods and Polinsky and Shavell's analytical methods. In what ways are the same and in what ways are they different? Do they give different or similar answers to analytical questions?

Lind doesn't have an explicit utility function, whereas PS do.

Lind does not speak of closed or open cities, although they obviously exist as cases of his analysis.

PS do not speak of surpluses, although they imply surpluses with WTP analysis.

Lind does not generate spatial rent functions, although he obviously could.

Fundamentally the two analyses give the same results.

2. Consider a highway that operates under the following parameters. Variable C = the number of cars per hour on the highway. (9.375 points per part)

Demand: Price $P = a_0 - a_1C$.

Marginal private cost: $MPC = b$.

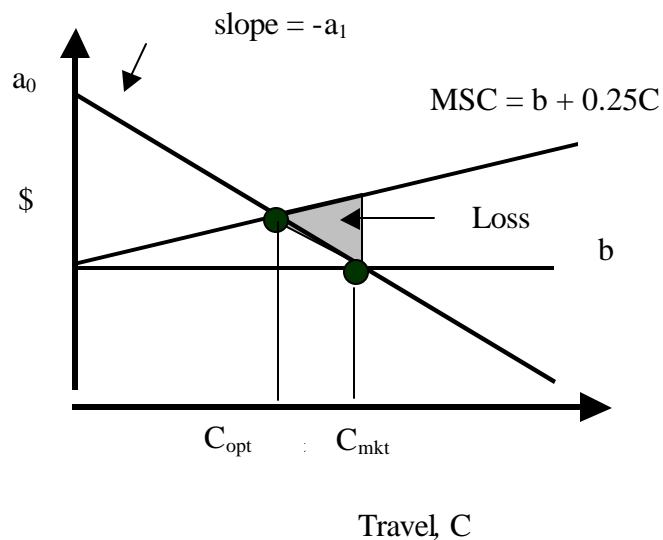
Marginal congestion cost: $MCC = 0.25C$.

a. Graph the demand curve and the cost curves.

b. Calculate the market equilibrium either graphically or algebraically. Explain your answer.

c. Calculate the optimal amount of travel, either graphically or algebraically. Explain your answer.

d. If the congestion is not priced, calculate the loss to society due to “excess travel.”



See diagram for answers.

3. Suppose that you were asked to conduct a hedonic price analysis in a metropolitan area, looking across both the central city and the suburbs. You have a standard set of housing and neighborhood variables x_i , as well as a variable for the property tax rate. (12.5 points per part)

a. All else equal, what should we expect the impact of increases in the property tax rate to be? Why?

Ans. We expect an increase in the tax rate to decrease the value of the asset.

$V = y/r + G/r - tV/r$, where G is the value of government services.

Leads to $V = (Dy + G)/(r + t)$. Increase in t increases the denominator.

b. Consider then the following hedonic regression:

$$\ln V = b_0 + \sum b_i x_i + e * t,$$

where t is the property tax rate with coefficient e . Calculate an expression for the impact of the property tax rate on value V of the house.

$$\frac{dV}{dt} = eV, \text{ or } \left(\frac{dV}{V} \right) / \frac{dt}{t} = e, \text{ or } \frac{dV}{V} = e \frac{dt}{t}$$

c. How would you interpret coefficient e ? How would you determine whether the estimated value of e is “sensible?”

Look at part a. $(dV/V) = -[1/(r+t)] * dt$. If $r = 0.08$, and $t = 0.02$, a 0.01 increase in taxes would yield approximately a 10% fall in house value. Compare this with e .

4. Suppose that the ABCD Co, a firm that employs 500 workers, decides to move from the Central City downtown area. After looking at locations all over the country, ABCD chooses to move to a new location 15 miles from the downtown, in the suburbs. Its new plant will employ 550 workers. Suppose that the Central City Council, unhappy with the proposed move, brings you in as a regional consultant, to make a report as to the impacts of the move. Discuss briefly, given your economics training, the following impacts. (9.375 points per part)

a. The impact on central city v. suburban land values.

Probably not likely to be a big impact, because 500 workers is not large compared with the rest of the economy.

b. The impact on central city v. suburban residents.

Could lead to adverse impact to central city residents depending on whether they can get to new jobs. May be much smaller than CC advocates contend.

c. The impact on central city v. suburban traffic congestion.

Likely to decrease CC traffic congestion. Increase suburban traffic congestion.

d. The “overall” impacts on the metropolitan area.

On net, somewhat beneficial to suburbs, and somewhat deleterious to CC. More jobs in metro area. Trying to prevent a move within metro area may send firm outside of area, and lead to substantial job loss.

5. Each of you presented an article in class on a given day with either 2 or 3 other presenters. Your task on this question is to analyze one of the two or three OTHER articles that were presented on the day that you presented. (12.5 points per part)

- a. Briefly discuss the main findings of the article that you have chosen.
- b. Discuss the weaknesses of the article that you have chosen.
- c. If you were doing a follow-up to the article, what would you improve or advance?