

2002 EMPA Microeconomics I Final

Show your reasoning using graphs, math, or both when appropriate. Keep answers brief but clear. Please define all the notation you use in your graphs and mathematical statements, and answer questions in your own words. On multiple-answer questions, **each part counts as 3 points unless otherwise marked**. Good Luck. (Total points possible = 75)

1. (12 points) Warm-up question.

- Write your name on your blue book.
- Draw a typical demand curve and a supply curve for the market for spam. Explain in 30 words or less why demand slopes down and supply slopes up.
- Very briefly explain what it means for this market to be in equilibrium.
- After years of government-funded research, medical science discovers that coffee causes irreversible bad breath. Coffee drinkers are in a panic. What do you expect to happen to the equilibrium?

2. (11 points) The current market for cornea transplants in the U.S. is regulated by government policy which prohibits the families of cornea donors (who are always deceased) from receiving financial compensation of any kind. The regulation is quite effective because donated organs must be processed through a clearinghouse that matches donated organs with recipients. In addition, transplant ophthalmologists must receive organs for transplant through the clearinghouse or face penalties, including temporary or permanent revocation of their medical licenses.

- Even though some people receive no compensation for donated organs, they donate anyway. Describe the price and quantity exchanged in this market using supply and demand curves if demand slopes down and supply slopes up? Is this an equilibrium?
- The American Medical Association (AMA) has proposed supporting government policy that allows payment to families who donate organs of deceased relatives. Graph the supply curve that the AMA is implicitly assuming exists in the U.S. Do you agree with their assumption.
- (5 points)** Consider a third policy, which is to keep compensation at zero but increase Federal support for research on cataracts and other diseases of the cornea. Describe the long-term and short-term payoffs and how to balance them. Which of the three policies do you support now (tell me in a couple of brief sentences). Also tell me where the money will come from for this policy.

3. (18 points) Suppose George Will and Sam Donaldson live on a deserted island (everyone else left when they got there). Sam owns 10 units of sour grapes and George owns 10 units of rotten tomatoes. George and Sam get together to trade rotten tomatoes and sour grapes.

- Draw the edgeworth box and show the initial allocation point.
- Assume both have smooth, convex preferences (the usual case); draw the indifference curves through the initial allocation.
- Show a possible contract curve and explain its significance.
- Define a pareto efficient allocation and explain its meaning here.
- Who gains if Sam and George trade?
- Suppose the government declares that trade in rotten tomatoes is illegal because of health concerns. Who benefits from this new policy?

4. **(8 points—4 points for each part)** Suppose you have \$1000 to invest today so you decide to buy a 1 year bond. The interest rate is 20%. A 1 year bond is turned in after 1 year, at which time you get back \$1000 plus a \$200 interest payment.

- Show that the present discounted value of the bond payments is equal to the price of the bond (\$1000).
- Suppose you buy the bond but then immediately decide you want to donate the \$1000 you spent on the

bond to Bill E's run for the mayoralship. However, you discover that the interest rate has gone down to 10%. For how much will you now be able to sell the bond (ie, what is the PDV)? What is the price now?

5. (9 points) You have the opportunity to live in a rent-subsidized apartment, but the landlord demands *key* money (an up front payment for an apartment renting below the market rate).

a. (6 points) Suppose you wish to keep the apartment for 3 years, the monthly interest rate is 1%, and the rent-subsidized apartment saves you \$1,000 per month compared to renting an identical market-rate apartment. Find the maximum amount of key money you will be willing to pay to the landlord. (Assume all other costs of getting an apartment are the same for rent-subsidized and market-rate apartments.)

b. Key money is an illegal practice even for market-rate apartments. Consider only market-rate rentals in this part of the question. Suppose also that there are two types of tenants in the world: long-term and short-term. Landlords benefit most from having long-term tenants. Should key money be legalized?

6. (18 points) A farmer faces an income that depends on the weather: good weather, which will occur with .4 probability, will bring an income of \$100; bad weather, which will happen with .6 probability, will bring an income of \$40. Let $U(I) = I^{0.5}$, where I is income.

a. What is expected income and standard deviation?

b. What is expected utility?

c. Is the farmer risk-averse? Explain why or why not using the farmer's marginal utility of income (hint: just plot marginal utility at a couple of points, or use any other appropriate method).

d. Define the "certainty equivalent" income. What is it for this problem?

e. Would the farmer quit farming for a job that offered \$62 for certain? Explain.

f. Would a risk neutral farmer quit farming for the job that offered \$62 for certain?

7. (12 points) Most workers have jobs that involves doing more than one well-defined task. Defining incentives for workers is further complicated by the fact that the output of each task may be easy or hard to observe.

a. Explain the concept of moral hazard and give an example relevant to this situation.

Consider the following observations and provide an economic explanation:

b. Police officers spend too much time writing tickets and not enough time making sure neighborhoods are safe.

c. Senators spend too much time doing favors for firms that could hire them in the future.

d. CEO's who spend too much time flying the company plane to Bermuda for business meetings on the golf course.