Ageco 350, February, 2013
Review Questions for the first exam

The following pages contain a list of questions that I think you should be able to answer given the readings and the material we have gone over in class. In preparing for the exam I recommend focusing on these questions, the key concept sheets, work completed in class, and old exams. In terms of graphs, you should make sure that you can quickly make graphs dealing with WTP/demand, MC/supply, consumer and producer surplus, public goods, positive or negative externalities, and policies to address externalities.

Copies of previous exams are on the old 350 home page: http://agecon2.tamu.edu/people/faculty/woodward-richard/350/. However, the material changes somewhat from one year to the next. So be aware that material included in previous years may not be the same as that covered this year.

To perform well on the exam you must be able to answer these questions. You must understand the concepts, not simply be able to reiterate the answers to questions you’ve already seen.

- There will one or more “clippings questions” in which you are asked to read a short article and answer questions that require that you apply economic concepts to the issues discussed in the article.
- There will be two RAT repeat questions that will be adapted from RATs 1 and 2.

YOU WILL BE ALLOWED TO BRING TO THE EXAM ONE 3X5 INCH NOTECARD WITH NOTES ON BOTH SIDES OF THE CARD.

No calculators will be allowed. If calculations are necessary, you can simply write out the formula that you would type into your calculator.

Value

1. Referring to the graph below, answer the following questions
   a. Why does the individual demand 1,000 units if the price is $20?
   b. Why would a firm want to supply 2,000 units if the price were $5?
   c. What is the equilibrium price and quantity? Why is this an equilibrium?
   d. In what sense is the equilibrium also efficient?
2. Consider the graph below. You should be able to answer many questions about this graph.
   a) What is the MNB of the very first unit consumed?  
   b) Identify the price that people would be willing to pay for the 300th unit. 
   c) Identify the MNB of the 300th unit consumed. 
   d) Identify the net benefits if 100 units are consumed. 
   e) Identify the total costs if 200 units are consumed. 
   f) Suppose you are evaluating a project to produce 300 units. What would be the benefits, what would be the costs, and would it pass a one-step benefit cost test? 
   g) Assuming that the characteristics of efficient property rights are satisfied, explain why the market clearing price is $40. 
   h) What would be the economic measure of waste if the government does not allow the firm to produce more than 100 units? 
   i) If creating each unit creates pollution that has an economic cost of $20, what would be the socially efficient quantity and why would the market lead to an inefficient outcome? 
   j) If the benefits of the good are nonexclusive (i.e., when one person pays to have them created everyone in society benefits), will the market lead to an efficient allocation? Explain using an example economy in which there are only two people.

3. Some people argue that the environment cannot be valued while economists value environmental services based on the notion of willingness to pay. In intuitive language, why is willingness to pay a good measure of the benefits of an environmental service? (Consider the fact that real costs will probably have to be incurred if an environmental project is undertaken).

4. Suppose that the Texas Commission on Environmental Quality decides to regulate the pollution coming from cattle grazing operations in order to improve water quality and habitat for endangered species. They will require each farmer ensure that no manure will directly reach a waterbody (e.g. by fencing off the stream) and file reports with TCEQ every 6 months on the number of animals on their land.
   a. Identify two costs associated with this policy, one “out of pocket” cost and one cost that does not involve direct expenses. 
   b. Since all economic costs are opportunity costs, indicate the opportunity that is foregone for each of the costs listed. 
   c. Explain how the survey approach could be used to estimate the direct costs of this regulation. 
   d. Explain how the engineering approach could be used to estimate the direct costs of this regulation.
5. Consider the regulation mentioned in question 4 that leads to water quality improvements.

Nonmarket value and valuation

![Value Taxonomy Diagram]

a. Using the value taxonomy above, identify a benefit that might be associated with four of the six starred end points of graph.
b. What is a benefit, the value of which might be estimated using the Travel Cost method?
c. What is a benefit, the value of which might be estimated using the Contingent valuation method?
d. What is a benefit, the value of which might be estimated using the Hedonic valuation method?
e. What is a benefit, the value of which might be estimated using the averting or defensive expenditures method?

6. The table below presents the number of trips taken to a river by a representative individual living various distances from river. The table presents the number of trips that are currently taken and the number of trips that are expected to be taken after the river has been cleaned up.

<table>
<thead>
<tr>
<th>Miles traveled</th>
<th>Travel cost per trip</th>
<th>Trips taken before clean-up</th>
<th>Trips taken after clean-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>$10</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>100</td>
<td>$20</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>150</td>
<td>$30</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>200</td>
<td>$40</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>250</td>
<td>$50</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

a. Using the travel-cost method and assuming that the preferences (i.e. the WTP curves) of all people are identical, estimate how much an individual living 100 miles from the river would be willing to pay for his or her second trip to the river before and after the clean-up.
b. Using the travel-cost method, show graphically the net benefits of the cleanup to an individual living 100 miles from the river.

Efficiency

7. Your Aunt Sue is a diehard environmentalist. She’s convinced that every environmental regulation needs to be stronger. In fact, she thinks that pollution should be illegal. Write a short e-mail message to your Aunt explaining why some level of pollution makes sense in terms of social efficiency.
8. Your Uncle Bob is a true believer in the free market. He’s convinced that every environmental regulation needs to be eliminated. Write a short e-mail message to your uncle explaining why some level of government regulation of pollution makes sense in terms of social efficiency.

9. Using a graph explain in words why some level of fracking (i.e. more than zero) is probably economically efficient, but why it a completely unregulated industry will probably not achieve the economically efficient outcome.

Characteristics of efficient property rights, success & failure

10. The supply and demand curve below presents a market equilibrium in which Q* units are sold in the market.

a. Explain in words why the market equilibrium is said to lead to a socially efficient outcome (i.e., where the net benefits to society are maximized).

b. What would be the equilibrium quantity if enforceability is not satisfied? Explain. Why would the outcome not be economically efficient (i.e., would not maximize net benefits to society)?

c. What would be the equilibrium quantity if transferability is not satisfied? Explain. Why would the outcome not be economically efficient (i.e., would not maximize net benefits to society)?

d. What would be the equilibrium quantity if exclusivity is not satisfied? Explain. Why would the outcome not be economically efficient (i.e., would not maximize net benefits to society)?

Public goods and externalities

11. Give an example of how the free-rider problem affects life at Texas A&M leading to an outcome that is not socially optimal.
12. Using the graph below, identify each of the following. Remember that *marginal* values should be vertical distances, while *total* values should be areas.

![Diagram](image)

a. The marginal external cost.
b. The total external costs if the market equilibrium quantity of the good is provided.
c. The socially efficient level of the good.
d. The privately efficient level of the good.
e. The welfare costs that arise without any kind of intervention in the market.
f. The welfare cost that would arise if production of the good were made illegal (i.e. restricted to zero).

13. Al and Betty both value park land, which is nonrival and nonexcludable. Their MWTP curves are presented in the figures below.

a. On the graph on the right, draw the societal MWTP curve.
b. Suppose that Betty has the ability to build parks and she can do so at a cost of $2 per acre. Approximately how many acres would she build if she is seeking to maximize her private welfare. Would this be socially efficient? Explain why or why not.
c. Suppose now that Al has the ability to build parks and she can do so at a cost of $2 per acre. Approximately how many acres would he build if he is seeking to maximize his private welfare. Would this be socially efficient? Explain why or why not.
d. Suppose that there are thousands of people like and thousands of people like Al. What would be the socially optimal number of park acres?
Environmental policies – taxes, subsidies, liability rules, Coaseian bargaining

14. The graph below shows the Freddy’s willingness to pay to travel to Lake Wannabefishing. For example, he is willing to pay up to $80 for his first trip, but he would only pay up to $40 for his 5th trip.

\[ \text{WTP} \]

a. Assuming each trip costs $30, how many trips per year would Freddy take? Is this the privately efficient number of trips?
b. Freddy uses his obnoxiously loud boat. In total, the other people at the lake would be willing to pay Freddy $10 per trip to go to another lake where he would be by himself. What is the socially efficient number of fishing trips to the lake?
c. Assume that the people living on the lake are unorganized so they can’t get together to pay Freddy $10 per trip. What is a policy that the local government might use to achieve the social optimum?
d. What is a regulation that the local government might use that would not achieve the social optimum? Explain why this would not be socially efficient.

15. You are a legislator and environmentalists are trying to convince you to put regulations on wakes generated by boats. You respond that it would probably be more efficient to simply make boat owners liable for any damage caused.

a. Using a graph, explain your point.
b. Suppose instead that you decide to fix the problem by requiring any boat owner seeking to create wakes to negotiate the right to do so with affected parties. Explain how such negotiations would lead to Pareto improvements relative to the no-wake policy suggested by your aids. It may be useful to use a graph.
 Tradable permits policies

16. The graph below shows the marginal costs of cleaning up pollution by two firms, 1 and 2.

![Graph showing marginal costs of cleaning up pollution for two firms, MC1 and MC2. The x-axis represents thousand tons of clean-up, and the y-axis represents dollars per ton.]

a. Explain why requiring both firms to clean up 4 thousand tons would not be a cost efficient way to clean up a total of eight thousand tons.

b. If a tax of $5 per ton of pollution were charged, how much pollution clean-up would be achieved?

c. Suppose the regulator wanted to achieve a total of 13 thousand tons of clean-up through a subsidy on pollution reduction. How much would she have to pay the firms per unit of pollution in order to achieve her goal?

d. Assume now that the regulator chooses to regulate through command and control policy in which each firm is required to clean-up exactly 5 thousand tons. Show graphically the total cost to the two firms of this policy.

e. If the firms were able to make trades away from the point where each cleans up 5-thousand tons, would any trading take place? If so, what is the range of prices that might have been agreeable to both firms for the first couple tons that they trade?

f. Suppose that in addition to allowing trading, the government tells the firms that they will be charged $5 per ton for every ton that they are out of compliance. So, for example, if a firm buys no credits and emits 6,000 tons (1,000 above its initial limit) it will have to pay a fine of $5,000. What would be the effect on the abatement by each firm? Would there be any trading?

17. Consider the program that allowed for the trading of SO$_2$ emissions allowances under Title IV of the Clean Air Act.

a. How did the program help reduce the cost to diminish SO$_2$ emissions in the U.S.?

b. What was the basic problem that led to the end of trading in the program?