

Resource & Environmental Economics Field Examination  
May 2010

Instructions:

- You have 4 hours to complete the exam. This time commences at the end of the 15-minute reading period during which no writing is allowed.
- Please use your assigned "alpha letter" on every page to identify your exam and number each page. Do not use your name or social security number. Write on only one side of the page leaving at least one inch margins. When you submit the exam, make sure the pages are in order.

Answer four of the following five questions.

1. One of the most universal ideas in environmental and resource economics is what Garrett Hardin called, "The Tragedy of the Commons."
  - (a) State in the most general way possible what is meant by this phrase.
  - (b) Discuss how this idea can relate to three problems:
    - (i) a renewable resource management context,
    - (ii) a problem of pollution from nonpoint sources, and
    - (iii) the management of a nonrenewable resource (e.g., oil reserve) that extends across a large geographic area.
  - (c) Explain why economists typically do not like Hardin's use of the word "commons," and how this relates to one way to solve the "tragedy."
  
2. The cost of reaching a specific deep aquifer (Deepblue) discourages ordinary people or smaller businesses from drilling wells to it; however, several cities and large manufacturers have done so. Pumping from existing Deepblue wells had been unregulated, so well owners could pump as much as they like. Yet recently adopted regulations prohibit new wells or reconfiguration of existing wells. Natural recharge to the aquifer offsets only 50% of current pumping in an average year, so depletion is taking place. At the current rate of depletion, wells for some cities and large manufacturers will lose function in 20 years due to the falling water table. All wells will be nonfunctional in 30 years. Replacement water, via interbasin transfer of surface water using yet-to-be-built pipelines, is several times more costly than current ground water extraction and has negative environmental impacts.
  - (a) How would you characterize this water use situation as an economic problem in terms of underlying theoretical aspects or practical issues? Define the concepts you introduce and explain their consequences in this setting.
  - (b) List several economically motivated goals and objectives for policy formation. Identify multiple policy options and indicate which policy options are substitutes and which can be complements. Explain how they address the practical issues that you listed above in part (a).
  - (c) Select a preferred policy option and indicate why you prefer it in relation to your stated goals/objectives. Explain how this policy can enhance the region's future.

3. The State of Oregon has mandated urban growth boundaries (UGB) around all cities. An UGB constrains the expansion of urban development beyond this boundary. This growth management policy has affected land and housing prices in the region. Consider the case of Portland, the largest city in Oregon.
  - (a) Draw the land price gradient as a function of distance from the central business district in downtown Portland, including before and after the adoption of the UGB policy.
  - (b) Provide a detailed explanation of two empirical approaches to estimate the price effects from the UGB policy.
  - (c) Describe the empirical challenges with these two methodological approaches for accurately measuring the policy effect.
  - (d) Describe the potential welfare effects from adopting this policy, including the effects on different stakeholder groups in the region.
  
4. Tradable permits have been successfully used to help relieve several environmental problems in the U.S. in the past decade. First, outline the main economic advantage of environmental trading and demonstrate in the context of a simple model why economists favor this approach over fixed pollution standards (e.g. mandatory technology standards). Now consider the same approach is being posed to help solve global warming problems and the last big water problem in the U.S., which is nonpoint source pollution.
  - (a) Outline what you believe to be the strengths and weaknesses of tradable permits in solving these two problems.
  - (b) Explain why and whether you think the environmental trading approach has a high chance of success in coping with either of these two environmental problems.
  - (c) Explain the advantages and disadvantages of a cap-and-trade approach over using a carbon tax in the context of combating global warming.
  
5. Is Hotelling's rule relevant to the analysis of environmental and natural resource management problems today? In your answer be sure to provide a clear explanation of what is meant by "Hotelling's rule," and discuss why it is or is not relevant in analyzing specific resource issues.