

FALL 2009 - AED 503 ASSIGNMENT 2 (Due, Thursday, October 29)

Answer all of the questions below. Your answers should be as complete as possible, using diagrams and written explanations where appropriate. In order to get partial credit, provide more than a one-or-two sentence answer. Each complete question is worth 25 points.

(Q1) Suppose there is a simple economy with two goods, soda and chips, and two consumers, Jack and Jill. A policymaker decides that it would prefer a Pareto efficient market outcome to favor Jill much more than it favors Jack, relative to the Pareto efficient market outcome that would occur given the initial endowments of soda and chips. Using an Edgeworth Box diagram, show why the policymaker should use lump-sum transfers between Jack and Jill to meet its preferred outcome as opposed to distorting the prices of soda and chips. State the relevant welfare theorem underlying your answer.

(Q2) Suppose that production in a two good economy can be described by a concave production possibility frontier. Describe in your own words what the production possibility frontier represents. What assumptions would have to be made about production technology in order for the production possibility frontier to be concave? How does society choose a particular point on this frontier? Explain how this then determines the dimensions of an Edgeworth Box of exchange. What happens to the shape of the Edgeworth Box if society's preferences are biased toward one of the goods? What conditions have to be met for there to be simultaneous efficiency in production and exchange?

(Q3) Explain carefully why a firm producing hogs might generate a negative production externality by polluting a nearby river with animal waste. Suppose the hog firm's cost function is defined as $C_h(h,x)$, where h are hogs produced and x is river pollution from hog production. Define what is meant by the marginal costs of producing hogs and the marginal costs of abating river pollution. Assume the marginal costs of hog production increase with hog output, and marginal abatement costs decline with pollution, and the hog firm sells in a competitive market. Use the appropriate diagram to show where the hog firm will maximize its profits. Explain why if the hog firm cuts back its output, its profits decline and its total abatement costs increase.

(Q4) Suppose there is an airport that generates noise pollution. MAC are the airport's marginal noise abatement costs, while MPC represents the marginal noise pollution costs to the local population. Using the appropriate diagram, explain how a Pareto efficient level of noise pollution would be achieved if the local population has well-defined property rights over "peace and quiet". Would the same Pareto-efficient levels of noise pollution be achieved if the airport had the property rights to "peace and quiet". What could prevent the airport and local community reaching a Pareto efficient outcome?