Econ 362 - Government Regulation of Business
College of William and Mary May 1, 2012
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Final Exam

You have until 10:30am to complete the exam, be certain to use your time wisely. Answer all questions directly on the exam. You must show all of your work to receive full credit. Non-graphing calculators may be used (no graphing calculators or phones can be used). You may leave answers as fractions. Unless a problem says otherwise, you can assume that firms can produce fractions of units and charge non-integer prices (so a firm could produce 82.4 units and sell at a price of \$5.325 per unit). Remember to put your name on the exam. Good luck!

Name: **ID Number:**

1. (15 points) Explain two different methods for calculating the value of a statistical life. Be certain to clearly discuss the types of data used to arrive at the value of a life. Which of these two approaches do you think should be used for doing cost-benefit analyses related to product or workplace safety? Be certain to fully explain your answer.

2. (25 points) Suppose there are two polluting firms. Firm A produces 100 units of pollution if it spends no money on pollution controls. The total costs to the firm of reducing its pollution by R_A units are given by:

$$C_A(R_A) = R_A^2 \tag{1}$$

Based on this cost function, the marginal costs of reducing pollution are:

$$MC_A(R_A) = 2R_A \tag{2}$$

if the current level of pollution reduction is R_A. Firm B also produces 100 units of pollution if it spends no money on pollution controls but it has lower costs of reducing pollution given by the following total cost and marginal cost functions:

$$C_B(R_B) = \frac{1}{2}R_B^2 \tag{3}$$

$$MC_B(R_B) = R_B \tag{4}$$

where R_B is the amount that firm B has reduced its pollution. The marginal benefits to society of a reduction in the overall level of pollution are equal to \$50 no matter what the current level of pollution is.

(a) Suppose that the regulator must set a single pollution standard. What would the most efficient single standard be? Be certain to show work to justify your answer. (Hint: It may be helpful to graph the marginal benefit and marginal cost curves to see what deadweight loss looks like under a single standard.)

(b) Now suppose that a regulator is going to set separate pollution standards for each firm. What would the efficient level of pollution be for each firm? How much has total surplus increased by switching to different standards for each firm instead of the single standard in part (a)?

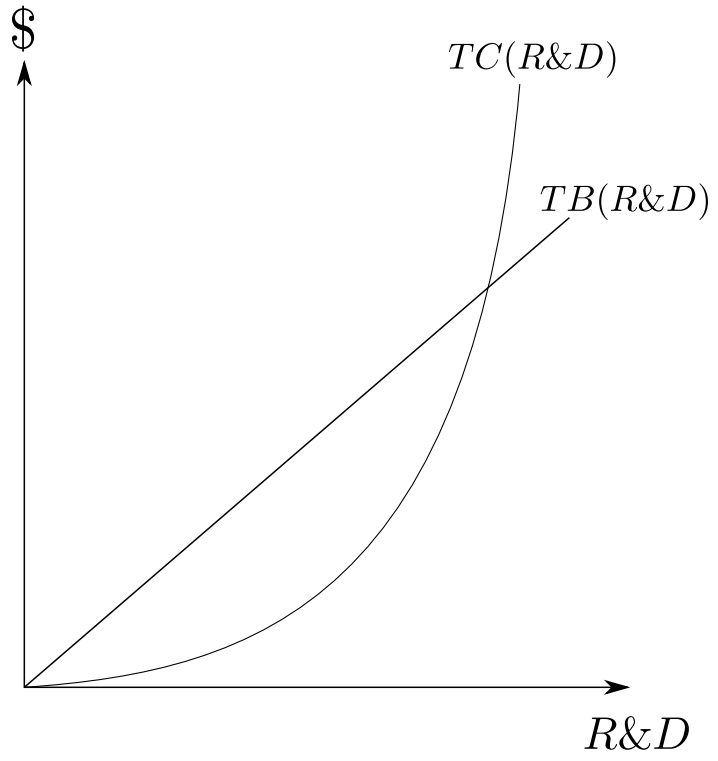
(c) Suppose that the regulator creates 100 pollution permits and divides these permits evenly between the two firms. Assuming that the firms are allowed to buy and sell permits to each other, what will the final distribution of permits between the two firms be? Is this distribution efficient? Be certain to justify your answers.

3. (20 points) Use the graphs on the next page to answer the following questions. The top graph shows the total costs and total benefits of spending on research and development related to developing new drugs for a pharmaceutical company. The horizontal axis measures the level of research and development. Costs and benefits are measured on the vertical axis. The bottom graph shows the marginal cost and marginal benefit curves for research and development implied by the top graph.

   (a) Show on both graphs what the firm's profit-maximizing level of research and development will be.

   (b) Now suppose that the FDA changes the rules for generics such that generics no longer need to prove that they are bioequivalent to name brand drugs, making it less costly for generics to enter the market when the name brand drug's patent expires. Use the graphs to show the effect that this will have on the optimal level of research and development from the firm's perspective.

   (c) Explain one reason why the change in policy described in part (b) may increase economic efficiency in the market for prescription drugs. Explain one reason why the change in policy may decrease economic efficiency in the market for prescription drugs.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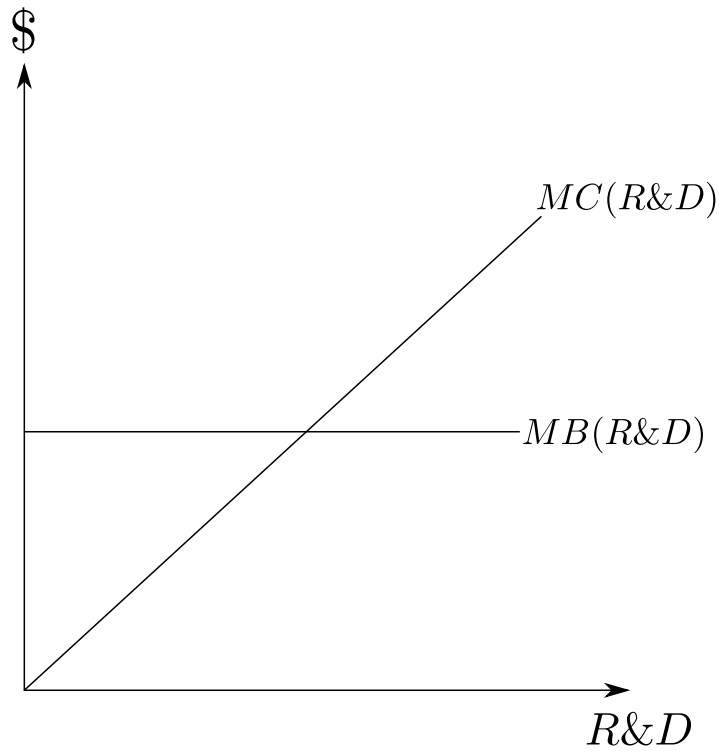
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MB(R&D)
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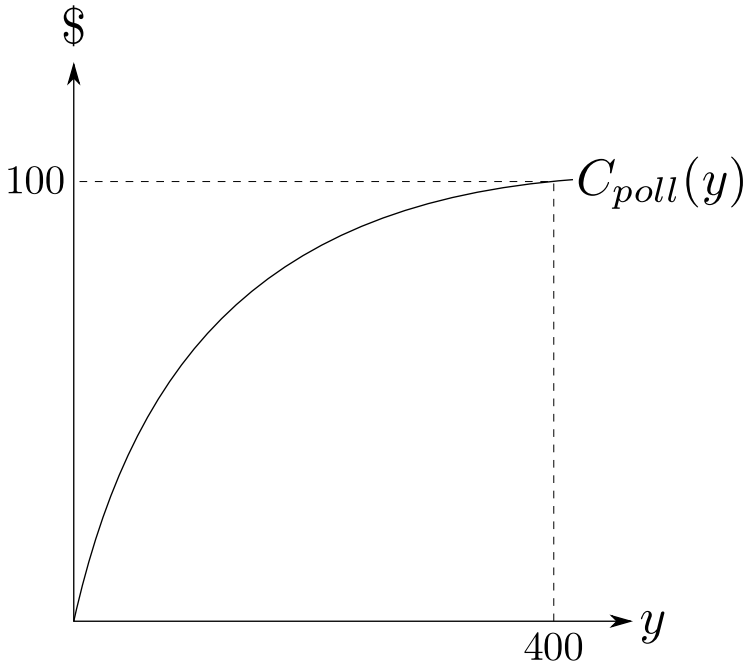
4. (15 points) The graph below shows the total cost of water pollution to society ($C_{poll}(y)$) as a function of factory output (y). Suppose that factories exhibit constant returns. In other words, if you double the size of a factory, you double the amount of output produced by the factory and the factory's total costs (not including the environmental costs of the pollution).

   (a) Use the graph and a written explanation to demonstrate whether it is more efficient to have one factory producing 200 units of output or two factories each producing 100 units of output.

   (b) Suppose that a regulator decides to restrict the number of factories to the efficient number you discussed in part (a). Explain why issues of equity may make this regulation unpopular. You can assume that there are two counties of voters. If there are two factories, each county gets one of the factories. If there is one factory, only one county is subjected to the factory's pollution.

   (c) Propose a way to redistribute surplus to address the equity issues raised in part (b).



5. (10 points) Answer one and only one of the questions below. You may not choose a question based on your own group presentation.

   (a) Explain one reason the federal government may want to regulate Google's use of user information (essentially mandating that Google adhere to a very strict privacy policy). Your reason should be focused on economic efficiency.

   (b) Explain why there may be a greater role for government regulation of automobile safety when it comes to behavioral standards than for manufacturing standards. You answer should focus on economic efficiency as the main goal of regulation.

   (c) Discuss the economic rationale for labeling organic food products and the main issues regulators face with determining what content to include on labels and the design of those labels.

   (d) Use a graph to show the economic impact of living wage legislation on worker and firm surplus in the labor market. Be certain to clearly label all key elements of the graph. Assume that a minimum wage is already in place before the living wage legislation is passed and that the living wage is higher than the previous minimum wage.

   (e) Would allowing a la carte channels (letting consumers pay for just the channels they want) make the market for cable television more or less efficient? Would it make the market more or less equitable? Be certain to fully explain you answers.

6. (15 points) The graph below shows the market for gasoline. The demand curve is labeled as $D(p)$. The marginal costs to firms of producing an additional gallon of gasoline are constant and given by the curve MC_{firm}. The curve MC_{env} shows the marginal costs of the pollution from an additional gallon of gasoline. This marginal cost is not taken into consideration by either the consumers or producers in the industry. The total marginal costs of a gallon of gasoline including both the firm's costs and this negative externality from pollution are given by the curve MC_{social}.

   (a) Label the quantity of gasoline that will be produced in the absence of any government regulation. You can assume that the market for gasoline is competitive and that average costs for the firm are constant and equal to marginal costs.

   (b) Label the socially efficient quantity of gasoline on the graph and the deadweight loss resulting from being at the quantity in part (a) rather than this socially efficient quantity.

   (c) On the graph, show the size of the quantity tax that would be necessary to achieve the socially efficient quantity of gasoline.