

Economics 5250
Fall 2006

Dr. Lozada
Midterm Exam

This exam has 33 points. There are six questions on the exam; you should work all of them. Questions 1–3 are worth 6 points each, while Questions 4–6 are worth 5 points each.

Put your answers to the exam in the blue books you have brought.

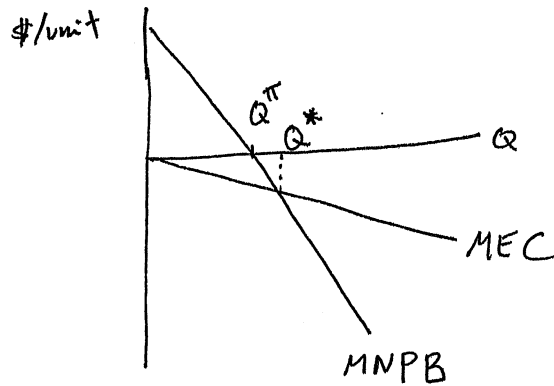
Answer the questions using as much precision and detail as the time allows. Correct answers which are unsupported by explanations will not be awarded points. Therefore, even if you think something is “obvious,” do not omit it. If you omit anything, you will not get credit for it. You get credit for nothing which does not explicitly appear in your answer. If you have questions about the adequacy of an explanation of yours during the exam, ask me.

Answer all of the following six questions.

1. **[6 points]** Sketch and explain a graph showing that if the production of a good Q also produces a positive externality, the free-market output of Q is too small.
2. **[6 points]** Graphically show the amount of Net Private Benefit lost by a firm upon whom is imposed an optimal Pigouvian tax. (Note that this question is not asking about Marginal Net Private Benefit, and least not directly.)
3. **[6 points]** What is “willingness to pay?” What is “willingness to accept?” Are they equal?
4. **[5 points]** What is “strategic bias” in contingent valuation studies? Give an example.
5. **[5 points]** What limits on greenhouse gas emissions would be necessary in order to ensure a return to pre-industrial mean global temperature?
6. **[5 points]** What is consequentialism and what does it have to do with this course?

Answers to 5250 Midterm Exam, Fall 2006

①



Q : quantity (output)

MEC: marginal external cost. It is < 0 since this is a positive externality, producing a benefit (which is a negative cost).

MNPB: Marginal Net Private Benefit.

The firm goes to where $MNPB = 0$ (which maximizes Net Private Benefit).

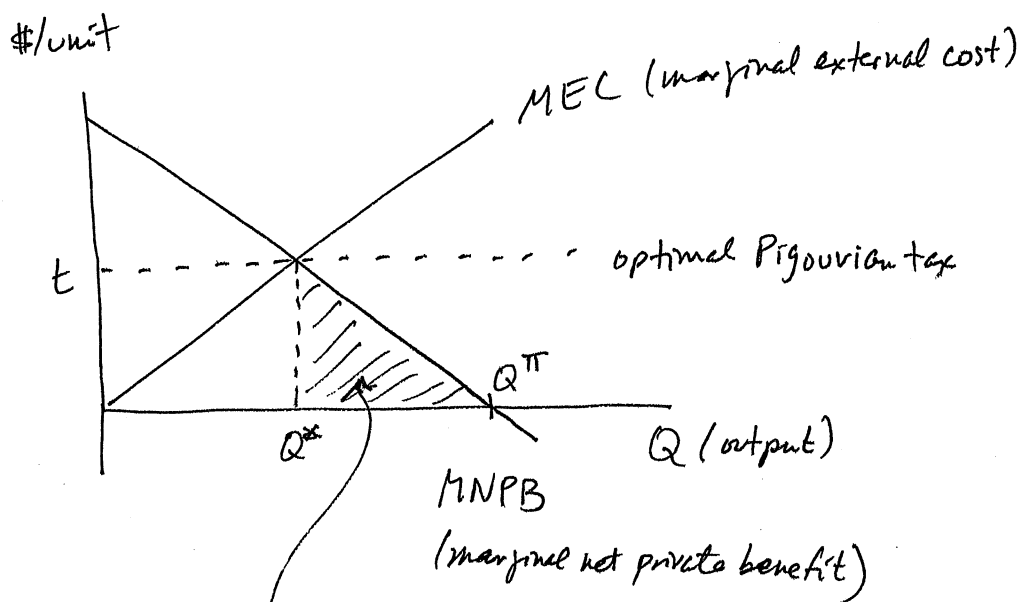
The optimal Q from society's viewpoint is Q^* . This is where

$$MNPB = MEC \Leftrightarrow \underbrace{MNPB - MEC}_{\text{marginal net social benefit}} = 0 \quad (\text{so Net Social Benefit is maximized}).$$

$Q^* > Q^\pi$ from the graph.

In the free market, the activity generating the positive externality is insufficiently rewarded, so not enough of that activity occurs.

(2)



shaded area = net private benefit lost due to the tax

(Net Private Benefit = area under MNPB)

Tax "t" changes output from Q^π to Q^* .

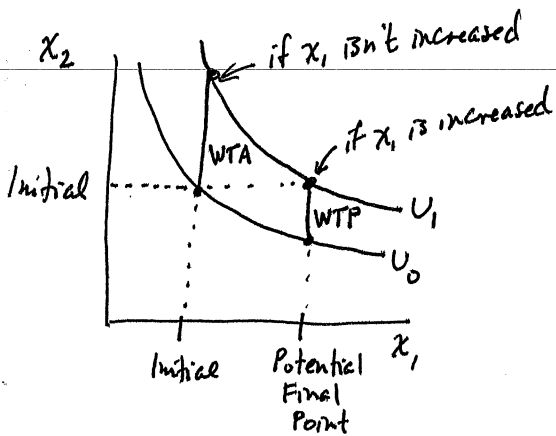
Q^* is optimal because it makes marginal social benefit
MNPB - MEC equal to zero.

The firm will produce $Q < Q^*$ because $MNPB > t$
there, but it will not produce $Q > Q^*$
because there MNPB is insufficient to cover t.

③ "Willingness to Pay" ("WTP") is the ^{largest} amount of money an agent would be willing to pay to obtain a gain or to avoid a loss due to some specific action.

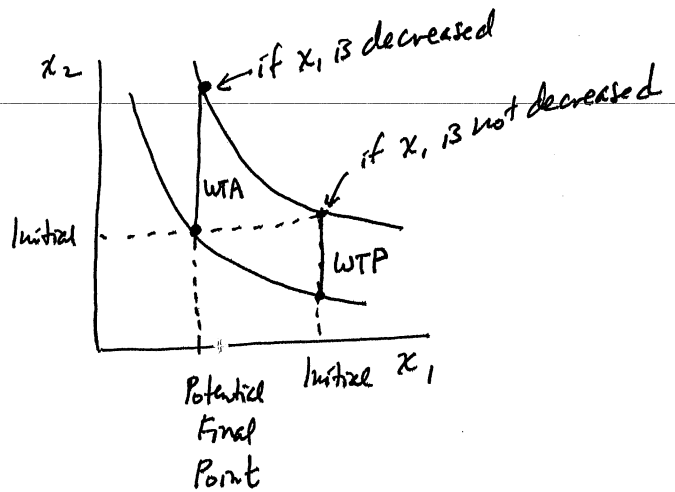
"Willingness to Accept" ("WTA") is the ^{smallest} amount of money an agent would be willing to accept in compensation for some specific action which causes a loss, or in compensation for not undertaking a specific action which would have caused a gain.

Gain



x_1, x_2 : commodities

Loss



WTP \neq WTA because the indifference curves are not linear

(4)

"Strategic Bias" is an intentional misrepresentation of a respondent's true preferences which is made because the agent has figured out that lying will produce an outcome he prefers to the outcome resulting from telling the truth.

The agent must have figured out how his response will affect the final decision. Then the agent reports (untruthfully) what will benefit himself.

Example: Free-riding on the willingness of others to sacrifice in order to improve environmental quality (by falsely stating that you do not appreciate such changes so you won't be charged).

Another Example: Falsely reporting your WTP or WTA by exaggerating them in response to a contingent valuation question (to skew the social decision in your favored direction).

⑤

A leveling-off of "Greenhouse Gas" ("GG") emissions would still increase the stock of GG in the atmosphere, thus making climate change continue. To return to pre-industrial temperatures, we'd have to return to pre-industrial GG emissions (so no fossil fuel burning, for example). Even if we did this, the excess stock of GG in the atmosphere now would only slowly decay. It would take a long time to get back to historical mean global temperature.

Getting back to the historical mean global temperature requires getting back to the historical stock of GG in the atmosphere.

That requires the net emissions of GG to be negative; now those emissions are positive and growing more positive.

⑥

Consequentialism means judging the correctness of an action by its consequences. Its opposite, nonconsequentialism, judges the correctness of an action by considering the action itself, in general, and not the consequences of the action in a particular case.

For example, the Ten Commandments of the Hebrew Bible are nonconsequentialist.

Most economics is consequentialist. An economic action having environmental consequences is not judged (by these economists) to be good or bad per se; instead, it's judged based on its consequences for people's utility.

Consequentialists could be very pro-environment or very anti-environment, depending on what they think the consequences of environmental damage are. Nonconsequentialists could be very pro-environment ("thou shall not cause a species to go extinct") or very anti-environment ("property owners should have the right to do whatever they want with their own property, such as their own land").