Economics 5250/6250 Dr. Lozada
Fall 2012 Final Exam

This exam has 67 points. There are seven questions on the exam; you should work all of them. Each question is worth either 9 or 10 points each.

Put your answers to the exam in a blue book or on blank sheets of paper. The figure for the exam appears after the questions.

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 questions.**

1. **[10 points]** In the chapter on fisheries, I described why "more [fishing] effort does not always yield more fish [in the steady state]." Prove that this is true by using (in part) a graph with steady-state stock size on the horizontal axis. On this graph, draw the "$F(x)$ function" (the excess of births over natural deaths), and draw "harvest versus stock size holding effort fixed."

2. **[10 points]** Suppose an exhaustible resource industry follows the Hotelling Rule. Contrast the price path of the resource in two worlds, the first with a high interest rate and the second with a lower one. Explain your answer.

3. **[9 points]** Your textbook says, "Blanket recommendations that common-property regimes be replaced by privatised ones are simplistic." (In U.S. English we would write "privatized" not "privatised.") Why does the book say this?

4. **[9 points]** In his Nobel Prize lecture (see `http://www.nobelprize.org/nobel_prizes/economics/laureates/1991/coase-lecture.html`), Ronald Coase first discusses the background to his first seminal paper, "The Nature of the Firm" (1937):

> The view of the pricing system as a co-ordinating mechanism was clearly right but there were aspects of the argument which troubled me [in 1931]. [My former professor Arnold] Plant was opposed to all schemes, then very fashionable during the Great Depression, for the co-ordination of industrial production by some form of planning. Competition, according to Plant, acting through a system of prices, would do all the co-ordination necessary. And yet we had a factor of production, management, whose function was to co-ordinate. Why was it needed if the pricing system provided all the co-ordination necessary? The same problem presented itself to me at that time in another guise. The Russian Revolution had taken place only fourteen years earlier. We knew then very little about how planning would actually be carried out in a communist system. Lenin had said that the economic system in Russia would be run as one big factory. However,

> many economists in the West maintained that this was an impossibility. And yet there were factories in the West and some of them were extremely large. How did one reconcile the views expressed by economists on the role of the pricing system and the impossibility of successful central economic planning with the existence of management and of these apparently planned societies, firms, operating within our own economy?
>
> I found the answer by the summer of 1932. It was to realise that there were costs of using the pricing mechanism. What the prices are has to be discovered. There are negotiations to be undertaken, contracts have to be drawn up, inspections have to be made, arrangements have to be made to settle disputes, and so on. These costs have come to be known as transaction costs. Their existence implies that methods of co-ordination, alternative to the market, which are themselves costly and in various ways imperfect, may nonetheless be preferable to relying on the pricing mechanism, the only method of co-ordination normally analysed by economists. It was avoidance of the costs of carrying out transactions through the market that could explain the existence of the firm in which the allocation of factors came about as a result of administrative decisions (and I thought it did).

Then he discusses his other famous paper, "The Problem of Social Cost" (1960):

> [...] Pigou's conclusion and that of most economists using standard economic theory was, and perhaps still is, that some kind of government action (usually the imposition of taxes) was required to restrain those whose actions had harmful effects on others, often termed negative externalities. What I showed in that article, as I thought, was that in a regime of zero transaction costs, an assumption of standard economic theory, negotiations between the parties would lead to those arrangements being made which would maximise wealth and this irrespective of the initial assignment of rights. This is the infamous Coase Theorem, named and formulated by Stigler,

> although it is based on work of mine. [...] I tend to regard the Coase Theorem as a stepping stone on the way to an analysis of an economy with positive transaction costs. The significance to me of the Coase Theorem is that it undermines the Pigovian system. Since standard economic theory assumes transaction costs to be zero, the Coase Theorem demonstrates that the Pigovian solutions are unnecessary in these circumstances. Of course, it does not imply, when transaction costs are positive, that government actions (such as government operation, regulation or taxation, including subsidies) could not produce a better result than relying on negotiations between individuals in the market. Whether this would be so could be discovered not by studying imaginary governments but what real governments actually do. My conclusion; let us study the world of positive transaction costs.

   (a) Discuss these passages in light of the way "free market economists" (or "conservative economists") sometimes present the Coase Theorem.

   (b) Would Coase think asymmetric information could seriously limit bargaining, as in the *Dilbert* cartoon of Figure 1?

5. **[10 points]** Graphically illustrate the difference between "willingness to pay" and "willingness to accept" for one consumer. Put "environmental good" on the horizontal axis and "other commodities" on the vertical axis. You do not have to consider both the case of a gain and the case of a loss.

6. **[10 points]** Discuss the Travel Cost Method, and one of the difficulties with it.

7. **[9 points]** Explain and cite examples of the international damages of sulfur dioxide [*not* carbon dioxide!] pollution, and how that affects society's management of it.

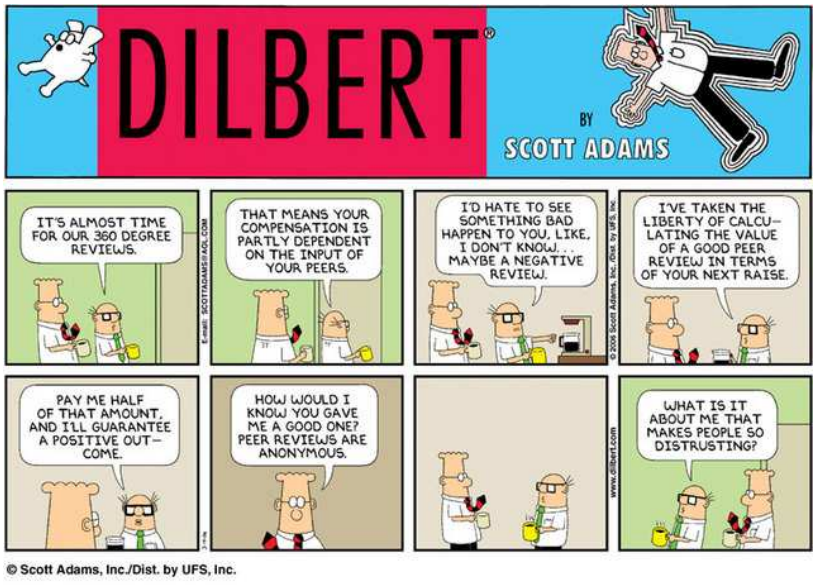
DILBERT
BY
SCOTT ADAMS
IT'S ALMOST TIME FOR OUR 360 DEGREE REVIEWS.
THAT MEANS YOUR COMPENSATION IS PARTLY DEPENDENT ON THE INPUT OF YOUR PEERS.
I'D HATE TO SEE SOMETHING BAD HAPPEN TO YOU. LIKE, I DON'T KNOW... MAYBE A NEGATIVE REVIEW.
I'VE TAKEN THE LIBERTY OF CALCULATING THE VALUE OF A GOOD PEER REVIEW IN TERMS OF YOUR NEXT RAISE.
PAY ME HALF OF THAT AMOUNT, AND I'LL GUARANTEE A POSITIVE OUTCOME.
HOW WOULD I KNOW YOU GAVE ME A GOOD ONE? PEER REVIEWS ARE ANONYMOUS.
WHAT IS IT ABOUT ME THAT MAKES PEOPLE SO DISTRUSTING?
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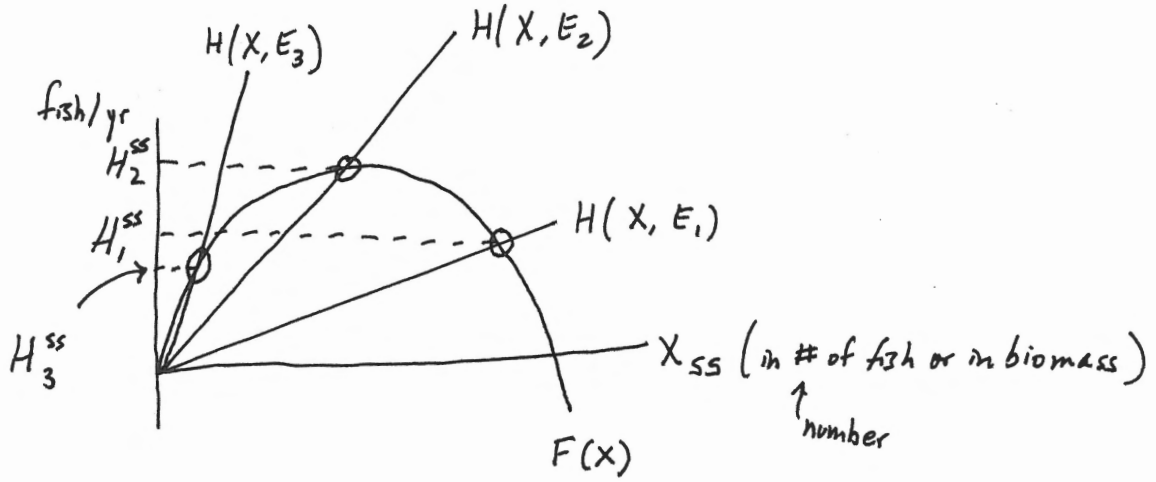
Figure 1

Answers to Final Exam, Econ. 5250/6250, Fall 2012

① 

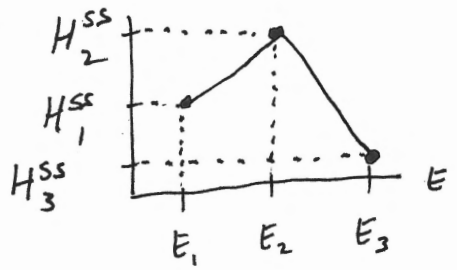

F(X) as in logistic growth is drawn.

We assumed H(X, E) was linear in X holding E fixed. For $E_2 < E_1$, the

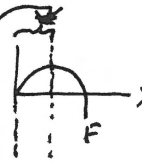
harvest ↑ stock size ↑ effort ↑

line $H(X, E_2)$ lies above the line $H(X, E_1)$ since more effort leads to greater harvest, other things being equal. (In particular, for equal levels of X.) Similarly, with $E_3 > E_2$, the $H(X, E_3)$ line lies above the $H(X, E_2)$ line.

At a steady state, $0 = \dot{X} = F(X) - H$, so $H = F(X)$. The steady-state points for $E_1$, $E_2$, and $E_3$ are shown by the open circles in the graph above. The corresponding steady-state harvests are $H_1^{ss}$, $H_2^{ss}$, and $H_3^{ss}$.

Graphing: 

While $H_3^{ss}$ might be $<$ or $>$ $H_1^{ss}$, both must be less than $H_2^{ss}$. To the right of $E_2$, more effort leads to less $H^{ss}$.

Optional: this is because $\uparrow E_{ss} \Rightarrow \downarrow X_{ss}$ (more effort leads to fewer fish, in the steady state) $\Rightarrow \downarrow F(X)$ if you're on this 

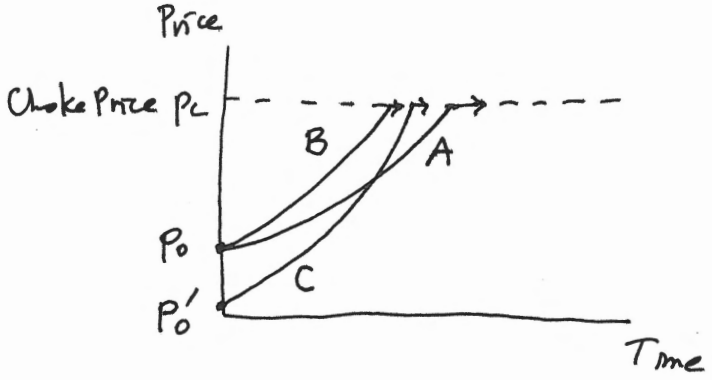
part of $F(x) \Rightarrow \downarrow H^{ss}$ since $H^{ss} = F(X^{ss})$.

(2)

The Hotelling Rule says that marginal profit rises at the rate of interest.

"Mπ"

$M\pi = MR - MC$. In the simplest (though most unrealistic) case, MC = 0, so MR would rise at the rate of interest, and the firm would be competitive, so price P would rise at the rate of interest. For simplicity, make this assumption. Then a higher rate of interest would imply a steeper price path through time.




Suppose the original price path begins at $P_0$ and follows the path labeled "A." The new price path — or, rather, the price path in the world with a higher interest rate — will be steeper, such as "B." However, B, which shares the same initial price as A, cannot be correct. Along B, price at each date is higher than along A, so quantity demanded will be everywhere lower; and since this has to be an equilibrium, that means

quantity supplied will be everywhere lower along B, so B leaves some resource stock in the ground forever (presuming it was all eventually mined with A).

The correct path for higher interest rates is "C," which is steeper than A but begins at a lower initial price, $p_0'$. Since C crosses A, sometimes price along C is higher than along A – and hence quantity lower – but at other times price along C is lower and so quantity is higher. Thus it is possible for total extraction to be the same along A and C.

(3)

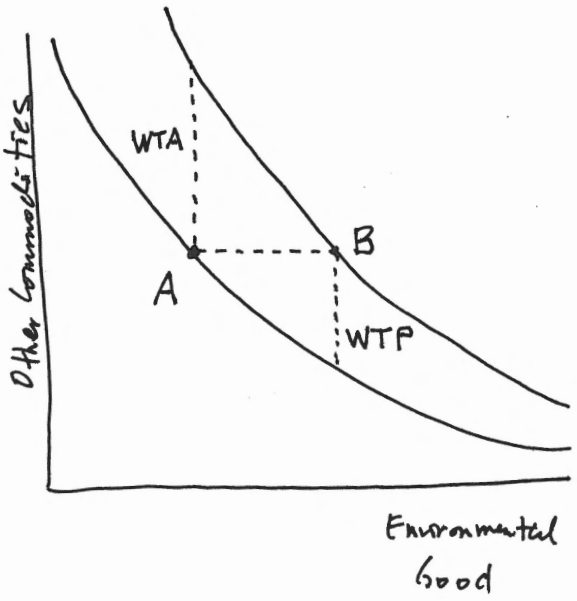
"Common property regimes" represent communal management of natural resources, often by traditional figures of authority such as village chiefs or priests. Many of these have sustainably managed resources for centuries, since before the rise of capitalism and its market economy. It is not obvious that replacing such successful management regimes with capitalistic ones would help society: certainly capitalistic, free-market resource exploitation can have bad outcomes in the presence of market failures, outcomes worse than those of some common property regimes.

(4) a) Conservative, or "free market," economists sometimes present the Coase Theorem as proving that government regulation is unnecessary even in the presence of externalities. That result depends on there being no transactions costs for bargaining. However, in "The Nature of the Firm," Coase explained that the reason we have firms — and a modern economy has a lot of firms, some of which are large and very powerful and important — is because of transactions costs. A "no transactions costs" world is a world with no firms except for sole proprietorships: a fictional world Coase was convinced was not relevant for the real world.

b) Yes, asymmetric information — such as lying about the location of the Marginal Net Private Benefit Curve or the Marginal External Cost curve — can certainly lead Coasian bargaining to a non-socially-optimal outcome. In the Dilbert cartoon, the fifth panel has one character suggesting a mutually-beneficial trade (mutually-beneficial to the two characters, not to the firm); however, the other character rejects the offer because he will never be able to know for sure that the first character has done what the trade requires him to do.

(5)

## Gain



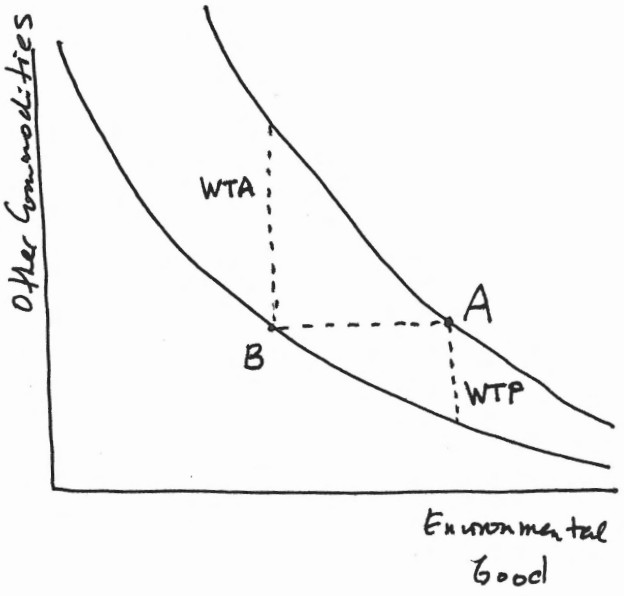

Potential Gain in Environmental Good:

$A \rightarrow B$.

If done, you'd be willing to pay up to WTP in other commodities in return for the ↑ in environmental goods.

If not done, you'd need WTA in other goods to compensate you for not going from A to B.

## Loss




Potential Loss in Environmental Good:

$A \rightarrow B$.

If done, you'd need WTA in other goods to compensate you for going from A to B.

If not done, you'd be willing to pay up to WTP in other commodities