ECON 1 – Section 11

Public Services and Public Goods.

Contact Details

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Section 11 Agenda

- **Administrative stuff (aprox. 5 min).**
- **Review of Last Session & Lecture (10 min).**
- **Problem 6 from PS#2 (10 min).**
- **Exercise 14-4 (10 min).**
- **Exercise 14-6/7 (10 min).**
- **Exercise 15-6/7 (5 min).**
- **Re-cap (aprox 3 min, let's see).**

Administrative Stuff - reminder

- **PS-2 will be returned Next Monday.**
  - Students not enrolled in class please check with Jaya (jsil@are.berkeley.edu) to attend section.
  - Handouts (only sections 104 & 133) after class in:

    http://www.ocf.berkeley.edu/~jaychen/econ1/
  - Please read: **Read before downloading!**.

Review Session

- Finally will be Monday from 11 AM to 1 PM (sorry for those who can not make it).
- Room still to be confirmed. Will be posted on the ECON Website.
- Intention is to spend 30-45 minutes reviewing important stuff.
- Rest of the time doing problems from the previous midterm (plus the llama problem).
- Try to solve the midterm before coming to the review session.

Review of Last Section - 9/30th

- Problems in:
  - Socially optimal outcome.
  - Coase Theorem.
  - Tragedy of Commons.
  - Rational Information Gathering/Search.
- Exercises 11-5 / 11-10 / 12-1

Review of Last Lecture - 9/30th

- Chapter 14:
  - Policies to regulate natural monopoly.
  - Marginal cost pricing of public services.
  - Taxation of pollution.
- Chapter 15:
  - Public Goods.
  - Provision of public goods (demand curve, free rider problem, elasticity)
  - What should we tax?

Important to remember !!

- **Public policy:** apply cost-benefit principle.
- **Natural monopoly** and Four Types of Government Control.
- **Pricing Public Services** (Health Care Delivery)
- **Environmental regulation. Taxing pollution.**
- **Types of public goods. Demand curve.**
- **Paying for Public goods.**

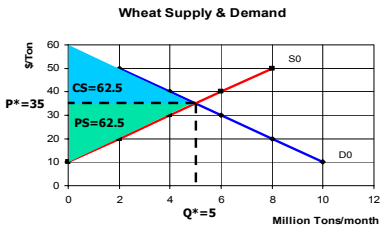
Exercise PS#2 - 6

- The US government is considering implementing a price support policy to assist US wheat farmers. The support price is to be $40/Ton.

Price ($/Ton)	Supply S0	Demand D0	Supply after TP (S1)
10	0	10	2
20	2	8	4
30	4	6	6
40	6	4	8
50	8	2	10

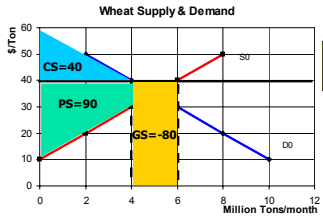
Exercise PS#2 – 6 (cont'd)

- A) Graph the industry supply and demand schedules, showing market P and Q at the free market equilibrium. Calculate consumer surplus , producer surplus and economic surplus.
  - Total ES = CS + PS = $125M



Exercise PS#2 – 6 (cont'd)

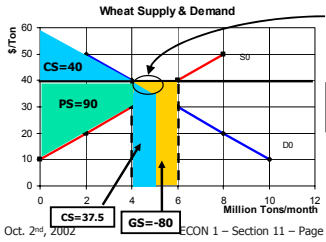
- B) Calculate consumer surplus, producer surplus and economic surplus under two versions of the price support policy.
  - **Policy #1**: The government gives all the surplus wheat production to developing countries as part of its Foreign Food Aid program (assume U.S. taxpayers do not think they benefit from the aid policy).



Total ES=CS+PS+GS= =40+90-80= $50M

Exercise PS#2 – 6 (cont'd)

- B) Calculate consumer surplus, producer surplus and economic surplus under two versions of the price support policy.
  - **Policy #2**: The government gives only half the surplus wheat production to developing countries and the other half to US consumers who value it most.

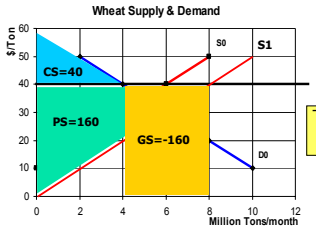


- The value to the consumers is less than the cost to the government.

Total ES=CS+PS+GS= =(40+37.5)+90-80= $87.5M

Exercise PS#2 – 6 (Conclusion)

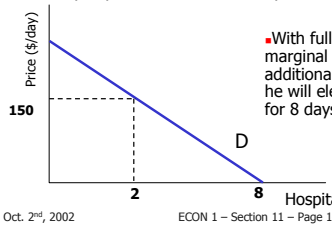
- C) Now suppose the government has implemented version #1 of the price support policy. Consider what happens if there is technological progress and the supply curve is given by S 1 in the table. Calculate consumer surplus, producer surplus and economic surplus.



Total ES=CS+PS+GS= =40+160-160= $40M

Problem 14-4 (F&B page 373)

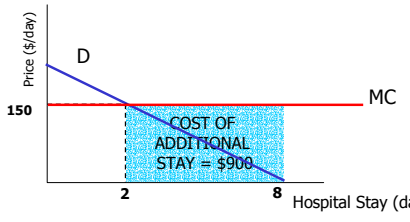
- In the case of a appendectomy, David's demand for hospital accommodation is as shown.
- David's current insurance policy fully covers the cost of hospital stays.
- MC for a hospital room is $150/day.
- A) If David's only illness this year is the appendectomy, how many days will he choose to stay in the hospital?



- With full coverage, David faces a marginal charge of zero for additional days in the hospital, so he will elect to remain hospitalized for 8 days.

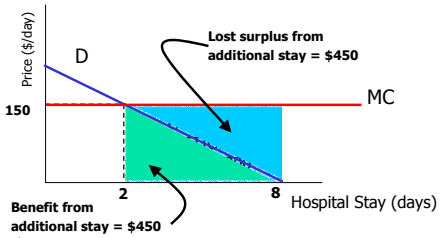
Problem 14-4 (cont'd)

- B) By how much would total economic surplus have been higher this year if David's hospital insurance covered only the cost of hospital stays that exceed $1,000 per illness?



Problem 14-4 (cont'd)

- And the cost of the stay is divided in:



Problem 14-4 (Conclusion)

- With insurance that covered only expenses greater than $1,000, he would face a marginal charge of $150/day, and would choose to stay in the hospital only two days.
- The cumulative amount by which the extra cost of an 8-day stay exceeds the extra benefit will be $450, the area of the darker shaded triangle in the diagram below.
- Thus, the six extra days cost society $900, but benefit David by only $450.
- So total economic surplus would have been $450 higher under the policy that covers only those expenses beyond $1,000 per illness.

Problem 14-6 (F&B page 374)

- Two firms, Sludge Oil (SO) and Northwest Lumber (NL) have 5 production processes, with different costs and amount of pollution.
- A) If pollution is unregulated, which process will each firm use, and what will be the daily smoke emission?

Process	A	B	C	D	E
Pollution (tons/day)	4	3	2	1	0
Cost to SO ($/day)	50	70	120	200	500
Cost to NL ($/day)	100	180	500	1000	2000

Problem 14-6 (cont'd)

- Both firms will use process A and emit 8 tons/day.
- B) Now city curbs smoke emissions by 50% and each firm has to reduce its emissions by 50%. What will be the total cost to society of this policy?

Process	A	B	C	D	E
Pollution (tons/day)	4	3	2	1	0
Cost to SO ($/day)	50	70	120	200	500
Cost to NL ($/day)	100	180	500	1000	2000

Problem 14-6 (Conclusion)

- Each firm must switch to process C.
- The cost will be:
  - SO: $120 - $50 = $70
  - NL: $500 - $100 = $400
  - Total = $70 +$400 = $470.

Problem 14-7 (F&B page 374)

- Now the city wants to curb emissions by half.
- But now imposes a tax of $T on each ton of smoke emitted per day.
- How large will T have to be to effect the desired reduction? What is the total cost to society of this policy?

Process	A	B	C	D	E
Pollution (tons/day)	4	3	2	1	0
Cost to SO ($/day)	50	70	120	200	500
Cost to NL ($/day)	100	180	500	1000	2000

Problem 14-7 (cont'd)

- **Remember:** Total costs = Operating cost + T*Tons of smoke.
- Whenever the cost of cutting a ton of pollution is less than $T/day, then the firm has an incentive o switch to a cleaner process.

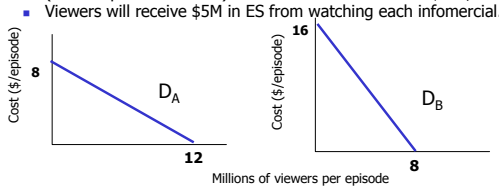
Process	A	B	C	D	E
Pollution (tons/day)	4	3	2	1	0
MC of reduction		*-T*	*-T*	*-T*	*-T*
Cost to SO ($/day)	50	70	120	200	500
MC of changing		*+20*	*+50*	*+80*	*+300*
Cost to NL ($/day)	100	180	500	1,000	2,000
MC of changing		*+80*	*+320*	*+500*	*+1,000*

Problem 14-7 (Conclusion)

- Each firm will switch to a cleaner process if the cost of doing so is less than $T.
- If T = $81, Sludge Oil finds it worthwhile to switch from process A to D.
- Northwest Lumber finds it worthwhile to switch from process A to B.
- Sludge Oil thus cuts emissions by 3 tons, and Northwest Lumber by one.
- The total cost to society is:
  - SO: $200 - $50 = $150
  - NL: $180 - $100 = $80
  - Total: $150 + $80 = $230.

Problem 15-6 (F&B page 398)

- Suppose demand for two TV shows are as shown.
- A TV network is considering to add 1 or both programs to the lineup.
- The only 2 remaining slots are sponsored by Colgate who pays the network $0.1 for each viewer that watches the program.
- Production cost for network is $400,000 per episode.
- If the network doesn't fill the slots, it can have infomercials (with no production cost) for which receives a fee of $500,000.
- Viewers will receive $5M in ES from watching each infomercial.



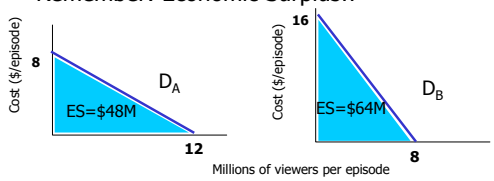
Problem 15-6 (cont'd)

- A) How will the network fill the 2 slots?
- Let's look at revenues, costs and profits.

SHOW	Revenues	Costs	Profit
A	12M viewers*$0.1 = $1.2M	$0.4	$0.8M
B	8M viewers * $0.1 = $0.8M	$0.4	$0.4M
IM	$0.5M	$0	$0.5M

Problem 15-6 (Conclusion)

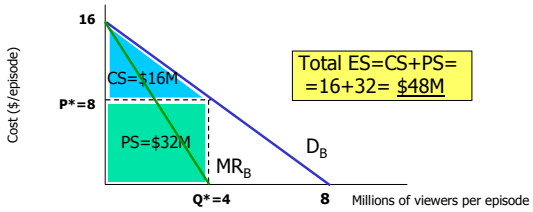
- B) Is this outcome socially efficient?
- Remember: Economic Surplus!!



- Since both figures are far larger than the surplus generated by the infomercial, the socially efficient result would be for the network to fill its two remaining slots with shows A & B.

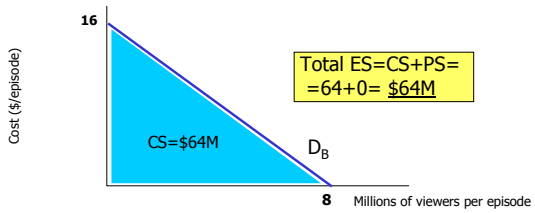
Problem 15-7 (F&B page 399)

- How much would total ES be higher if each episode of show B was shown free of charge instead of pay-per-view?
- Demand for show B is P=16-2Q.
- A) If pay-per-view:
  - MR = a-2bQ = 16–4Q.
  - Cost of episode = $0.4M then MC = $0 !!!!!



Problem 15-7 (cont'd)

- B) If free of charge:



Problem 15-7 (Conclusion)

- Since production costs of each episode would be the same under the two arrangements, total economic surplus per episode would be $16 million larger if broadcast free of charge PBS than if shown on pay-per-view.

Summary

- Terms:
  - Marginal cost pricing of public services.
  - Taxation of pollution.
  - Public Goods.
  - Provision of public goods (demand curve, free rider problem, elasticity)
- Applied to: 5 problems.

Next class

- Next Class:
  - Section 12 + Review Session – Monday, Oct 7th
  - You can download handouts this afternoon.
  - Read ch. 16 and review all previous material.
  - Thank you for coming on time !!!
- Enjoy the weekend !!.