Lecture 6(i)

- Midterm results posted next week.
  - o If you did well, that's great, we will count it as 22% of your course grade.
  - o If you do better on the other exams, don't fret. In this case Midterm 1 will only count 10%.
- Worksheet at Canvas on positive externalities for recitation this week.

Lecture

1. Positive and Negative Externalities

2. Nobel Prize in Economics this year. (For externalities!)

3. Graphing Externalities.

4. A negative externality in Econland.

1. Externalities

"An externality arises when a person engages in an activity that influences the well-being of a bystander and yet neither pays nor receives any compensation for that effect."

Negative: burning coal

1)Have negative external effects at the local and national level: (particulates in the air)

2) have global externality carbon gets into the atmosphere and goes global affecting climate change.

Artic
Melt

U.S. is a big carbon producer too. The U.S. and China account for over 40 percent of carbon produced. U.S. does better on local and national pollution levels. But take a look at the US before the the Clean Water Act of 1972

Cuyahoga River on Fire in 1969.

Other negative externalties?

- Particulates (local externality)
  Go to https://www.airnow.gov/
  to see how Minneapolis is doing
  now.

- Carbon (global externality)
- Congestion (local externality)

Examples of Positive Externalities

Maintenance of exterior of one's home (landscaping,…)

Research: (others can potentially imitate).

Studying hard in Econ 1101?
- Most of benefit is private
- Maybe a little external social benefit if some of your knowledge spills over to your roommate

Which homeowner above is not providing positive externalities to the neighbors by watering the lawn?

2018
Nobel Prize in
Economics
Integrating nature and
knowledge into economics

William Nordhaus (Yale):
   Nature (climate change)
Paul Romer (NYU):
   Knowledge (economic growth)

A prize about externalities!

From the official Nobel Prize Document:
https://www.nobelprize.org/uploads/2018/10/popular-economicsciencesprize2018.pdf

Imperfections in the global market Both laureates highlight spillover effects on society, which are consequences for others that were not taken into account by individual innovators or polluters. Any idea for a new technology, wherever it originates, can be used for the production of new goods and other ideas in any other place, now or in the future. Similarly, a newly emitted unit of carbon, whatever its origin, quickly diffuses in the atmosphere and contributes to climate change, affecting all of humanity now and in the future. Economists refer to these types of spillover effects as externalities. The externalities studied by Romer and Nordhaus have global reach and long-term consequences. As unregulated markets will generate inefficient outcomes in the presence of such externalities, the work of Romer and Nordhaus provides convincing arguments for government intervention.
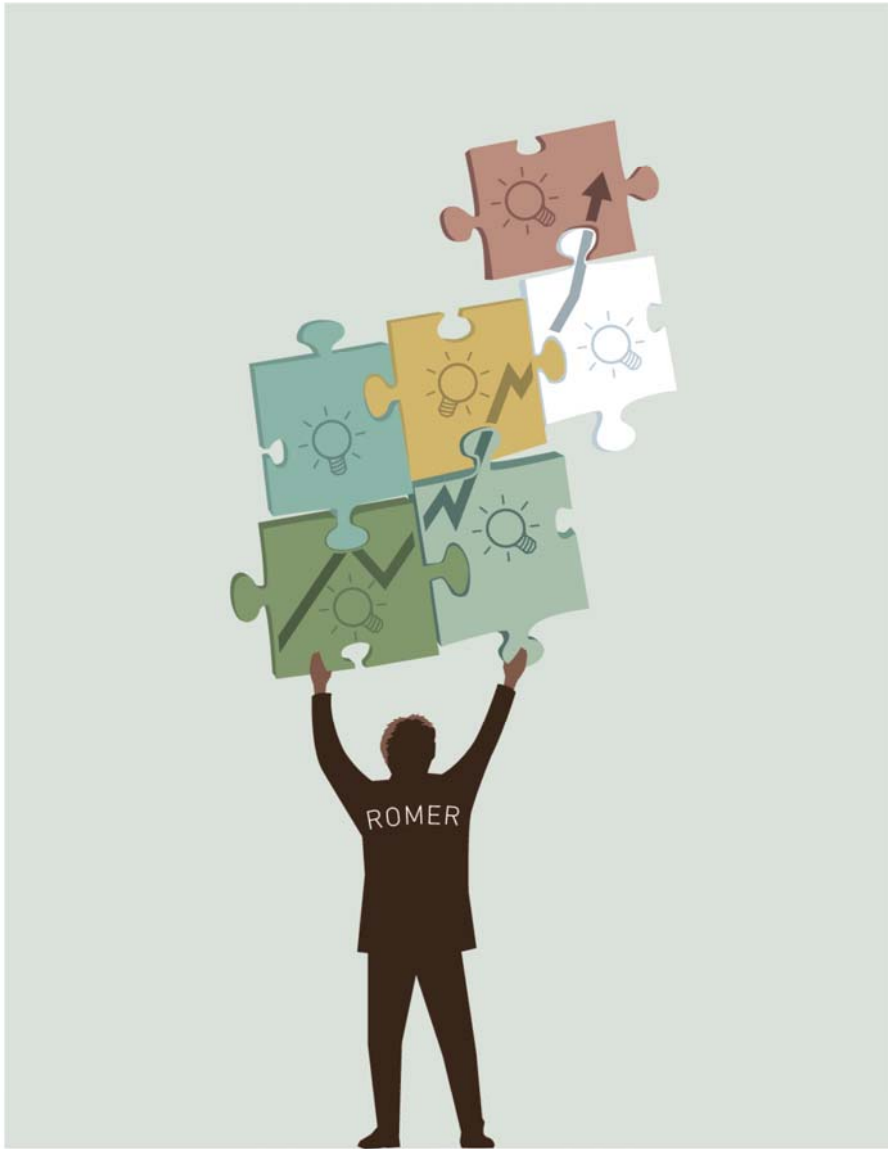
Romer's research shows how the accumulation of ideas sustains long-run economic growth.
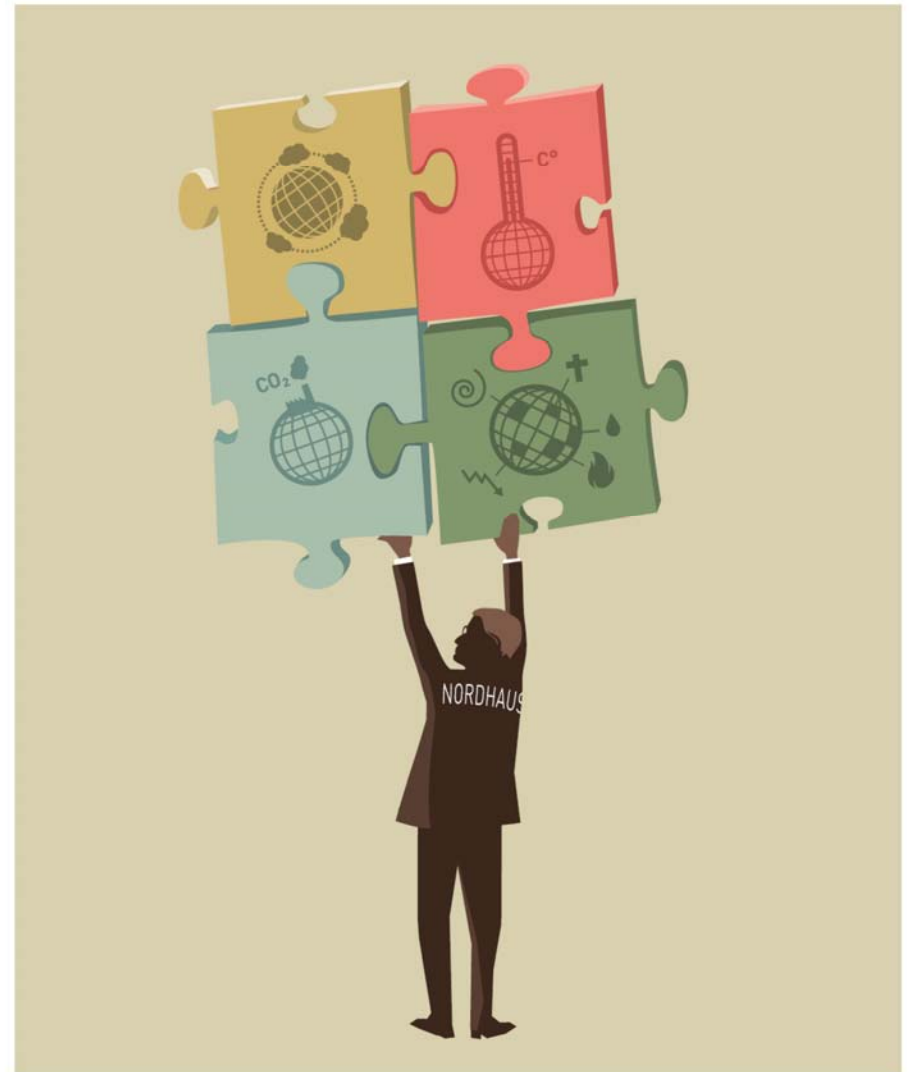
Nordhaus' research shows how economic activity interacts with basic chemistry and physics to produce climate change.

Social Marginal Cost	Social Marginal Benefit
= private marginal cost (cost of the last unit in to the **decision maker**	= private marginal benefit (value of the last unit in to the **decision maker**
+ external marginal cost (cost of the last unit to bystanders)	+ external marginal benefit (benefit of the last unit to bystanders)

With no externalities…

Social Marginal Cost (SMC)
= Private Marginal Cost (PMC)
(just the supply curve)

Social Marginal Benefit (SMB)
= Private Marginal Benefit (PMB)
(just the demand curve
also known as the marginal
reservation price)

With externalities…

Social Marginal Cost (SMC)
= Private Marginal Cost (PMC)
+ External Cost (EC)
(negative externalities)

Social Marginal Benefit (SMB)
= Private Marginal Benefit (PMB)
+ External Benefit (EB)
(positive externalities)

Free Market: quantity is where

Private Marginal Benefit (PMB)
= Private Marginal Cost (PMC)

Socially Efficient quantity is where

Social Marginal Benefit (SMB)
= Social Marginal Cost (SMC)

When EB=0 and EC=0 these are the same thing.

$$Q^{\text{Free-Market}} = Q^{\text{Socially-Efficient}}$$

First Welfare Theorem!

If **negative** externality, then EC>0 and at free-market quantity,
PMC < SMC

$$Q^{\text{Free-Market}} > Q^{\text{Socially-Efficient}}$$

Output too big

First Welfare Theorem

If **positive** externality, then EB>0 and at free-market quantity,

PMB < SMB

$Q^{Free\text{-}Market} < Q^{Socially\text{-}Efficient}$

Output too small

First Welfare Theorem
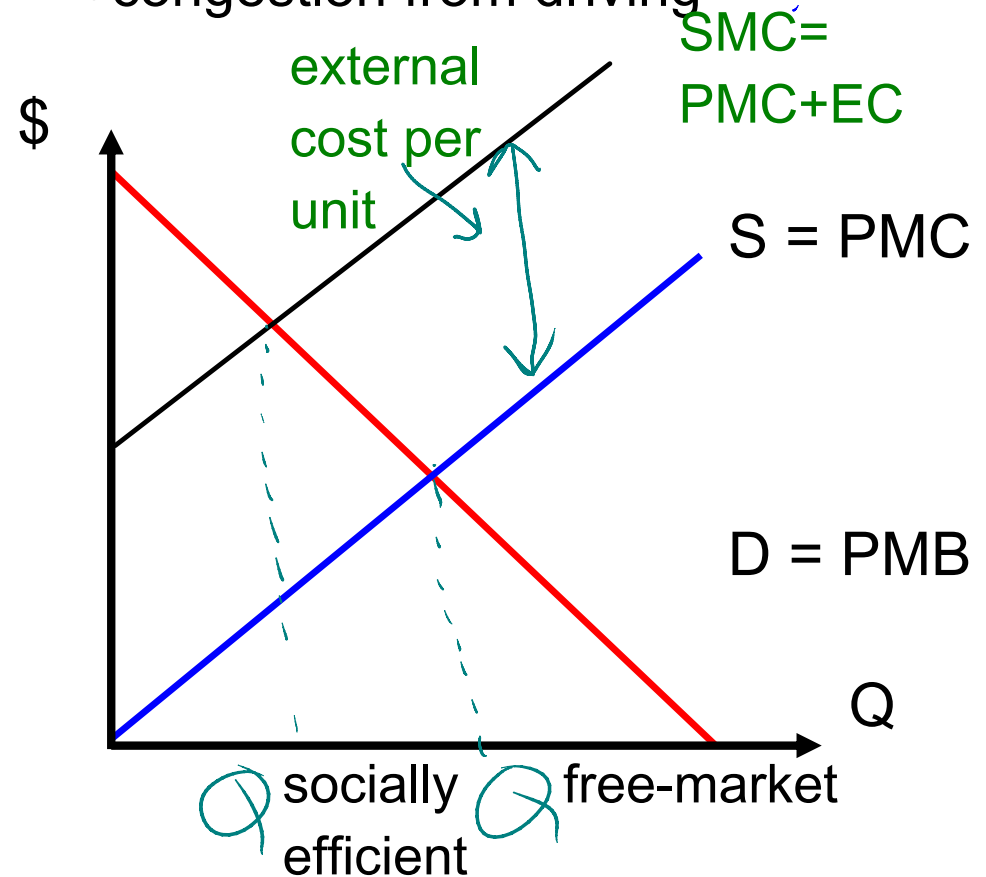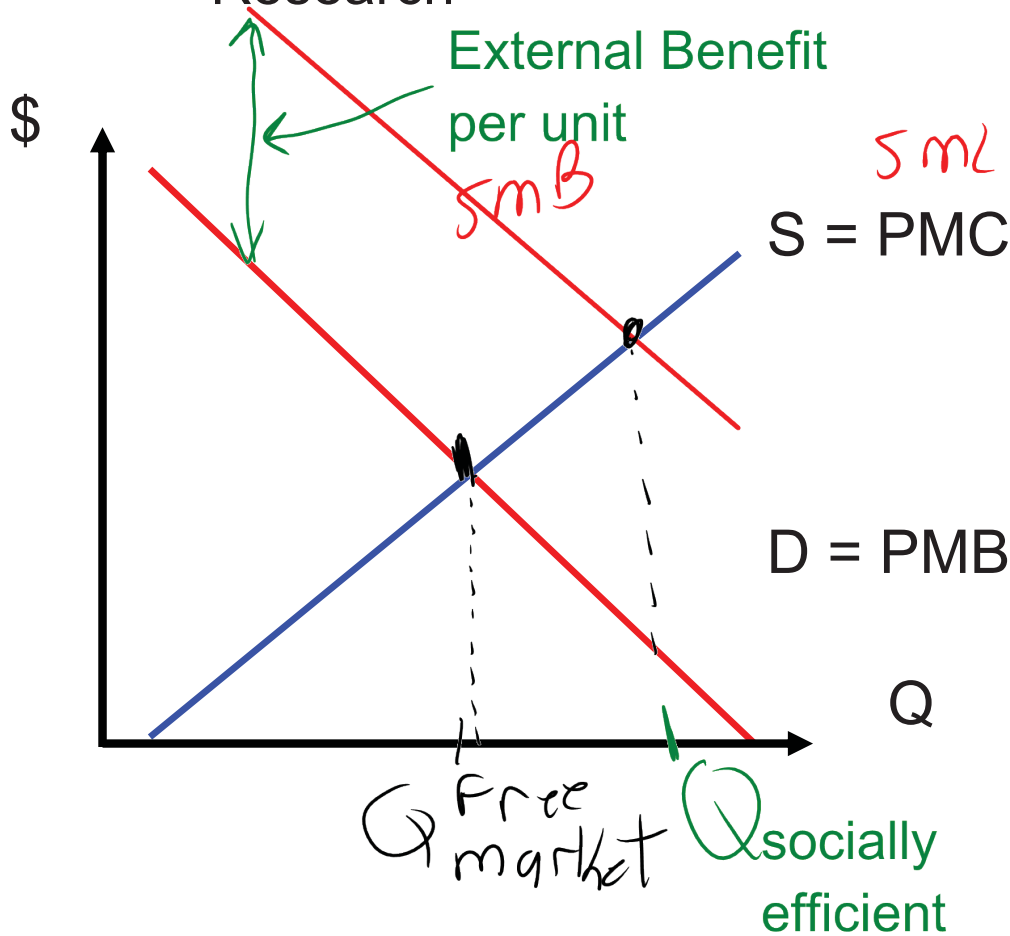
2. Graphing Negative Externalities:

EC > 0

- global warming from gasoline consumption (carbon use)
- congestion from driving

external cost per unit

SMC= PMC+EC

$

S = PMC

D = PMB

Q

socially efficient

free-market

Graphing Positive Externalities: EB>0

- New development in blighted areas
- Research

External Benefit per unit

SMC

SMB

S = PMC

D = PMB

$

Q

Q Free market

Q socially efficient

3. Negative Externality in Econland

$PMC + \$y$ (EC)

Production of 1 widget imposes an external cost of $4 per unit on others

SMC

$S = PMC$

External Cost = $4

D = PMB

Q

Socially Efficient

Q free market

$ PS in free market

5

5 Q
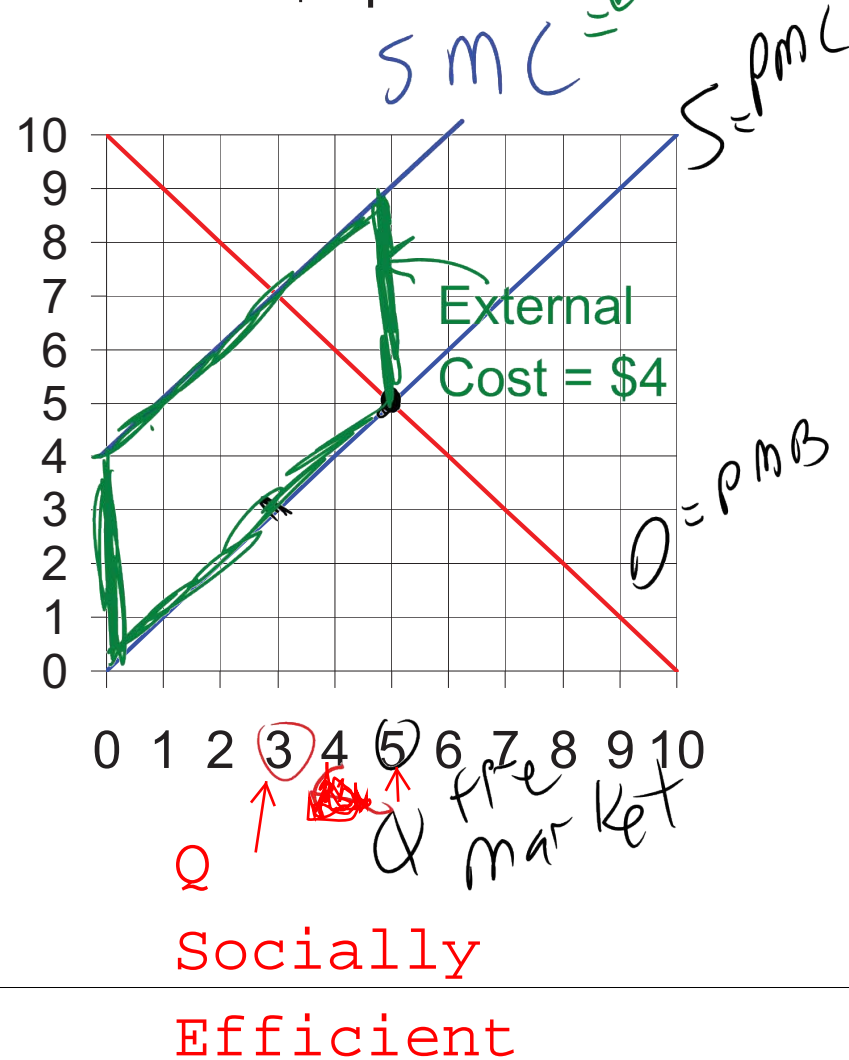
$$PS = 5 \times 5 \times \frac{1}{2} = 12.5$$

Free-Market Quantity
Where S = D
PMB = PMC

→Q=__5__

Overall cost of the externality
= 5 units produced times $4 per unit
= $20

Efficient Quantity
SMB = SMC (=PMC +EC)

Look on the graph where this point is:

→Q=__3__

	Free Market	$4 tax	
Q	5	3	
P^D	5	7	
P^S	5	3	
CS	12.5	4.5	
PS	12.5	4.5	
GS	0	12	
CS+PS+GS	25	21	
Externality	-20	-12	
TS	5	9	

What happens with a $4 tax (not a coincidence that this is the same as the externality)