Announcements

- Problem set 3 up later today.
- Discuss Scores on midterm Monday lecture
- Start Macro next time. Lots of reading. Stick to required pages.

About Exam

<table>
<thead>
<tr>
<th>Econ 1 Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>No study</td>
</tr>
<tr>
<td>Study a lot</td>
</tr>
<tr>
<td>2, 50s</td>
</tr>
<tr>
<td>2, 90s</td>
</tr>
<tr>
<td>1, 30s</td>
</tr>
<tr>
<td>1, 80s</td>
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</tbody>
</table>

Exam Questions

- NYT, July 11 Universities to Share Patented Work on Crops
- WSJ, June 18, Natural-Gas Prices Rock U.S.’s Chemical Industry
- WSJ, June 27 Amid Fight Over Teen Drinking, Panel Weighs New Alcohol Tax

Role of Government

Enhance Efficiency
Enhance Equity
Make/enforce Laws/Institutions

Public Goods

- Private Good: Excludable so can charge price and MB & MC determine P, Q
- Public Good: Non-rival and non-excludable
  - public park
  - public security (street light, airport security)
  - national defense
  - sanitation/garbage collection services

Efficiency: Increase size of pie, remove DWL
Equity: share pie, redistribute
Laws: collect tax, property rights
Institutions: courts, police, government agencies, etc
Public Goods

- Public Good Financing
  - Private: donation
    - contracting (garbage, airport security)
  - Public: tax
    - head
    - proportional
    - progressive/regressive

Public Goods

- Tax
  - head: flat amount
  - proportional: fixed % of income
  - progressive: increasing % of income
  - regressive: decreasing % of income

eg Head Tax of $1
Income = 10 (10%)
Income = 100 (1%)
so, regressive

Public Goods

- Lecture 6: example from problem 1 chapter 15
  - Finance neighborhood security guard
  - WTP > cost of guard, optimal to have guard
  - Head tax $60 each (regressive)
  - Fails to get financed since exceeds res price of one resident
  - Greater chance of financing with prop or prog tax

Externality

Eg. Pollution

Private: bargain/negotiation
  - Coase (zero transaction cost, property rights)
Public: tax, standard, auction permit

Externality

Eg. Private Bargain

Chapter 11, problem 8, Barton & Statler

<table>
<thead>
<tr>
<th>Soundproof</th>
<th>Not Soundproof</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gain to B</td>
<td>$100</td>
</tr>
<tr>
<td>Gain to S</td>
<td>$120</td>
</tr>
</tbody>
</table>

B has right to Pollution
S is victim & considers bribe
has to bribe 50, but gain is only 40
Pollution: B=150, S=80, surplus = 230

S has right to Pollution-free
B is victim & considers bribe
has to bribe 40, and gain is 50
Pollution: B=110, S=120, surplus=230

Doesn't matter who has right.
Externality
Example with no private bargaining, transaction cost high. Firms that pollute & many victims

No Regulation

Regulation with standard (not least cost)

Regulation with tax (least cost),
optimal tax trial & error

Regulation with auction permit (least cost, no info problem)
Costs and Emissions for Different Production Processes

<table>
<thead>
<tr>
<th>Process (smoke)</th>
<th>A (4 tons/day)</th>
<th>B (3 tons/day)</th>
<th>C (2 tons/day)</th>
<th>D (1 ton/day)</th>
<th>E (0 tons/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost to Sludge Oil ($/day)</td>
<td>100</td>
<td>200</td>
<td>600</td>
<td>1,300</td>
<td>2,300</td>
</tr>
<tr>
<td>Cost to Northwest Lumber ($/day)</td>
<td>300</td>
<td>320</td>
<td>380</td>
<td>480</td>
<td>700</td>
</tr>
</tbody>
</table>

Example with no private bargaining, transaction cost high. Firms that pollute & many victims

No Regulation 8 tons
Regulation with standard 2 ton each MC=580
Regulation with tax=$101, MC=280
Regulation with auction permit MC=280

Natural Monopoly

Monopoly due to economies of scale
Everywhere declining AC (so MC < AC)

Cheaper for 1 firm to produce many units
One firm is monopoly (monopoly DWL)

Economies of Scale: Declining ATC, ATC > MC

\[ TC = F + MQ \]
\[ ATC = \frac{F}{Q} + M \]

\( ATC \) Falls
\( ATC = \frac{F}{Q} + M \) Everywhere

Natural Monopoly

Regulate: force to produce more
force to sell at below monopoly price

Problem: what firm is a natural monopoly

public utility (ok)
railroad (ok) , trucking (no)
Redistribution

Distribution of Income according to Rawls
veil of ignorance
ideal=tend to equality

Distribution of Wealth according to Bill Gates Sr
wealthy got wealthy by relying on
govt institutions & infrastructure
ideal=reduce inequality

Redistribution

Distribution of Income

<table>
<thead>
<tr>
<th></th>
<th>1960</th>
<th>2001</th>
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</thead>
<tbody>
<tr>
<td>bot 20%</td>
<td>4.3</td>
<td>4.3</td>
</tr>
<tr>
<td>next 20%</td>
<td>12.2</td>
<td>9.9</td>
</tr>
<tr>
<td>next 20%</td>
<td>17.8</td>
<td>15.6</td>
</tr>
<tr>
<td>next 20%</td>
<td>24.0</td>
<td>23.0</td>
</tr>
<tr>
<td>top 20%</td>
<td>41.3</td>
<td>47.2 (almost half)</td>
</tr>
<tr>
<td>top 5%</td>
<td>15.9</td>
<td>20.7*</td>
</tr>
</tbody>
</table>

*1997

Redistribution

Policies that aim to equalize incomes:
Minimum wage
Means Tested Transfer Programs
  AFDC, Personal Responsibility Act
  Medicaid
Other Means Tested Programs
  EITC (tax credit for low income)

Summary: Government Role

Government enhances efficiency and equity and
makes & enforces laws.

Whether government should have role should follow
cost-benefit criterion, ultimately

Production and Consumption Possibilities and the Benefits of Trade

- A country’s PPC shows the quantities of
different goods that its economy can
produce.
- Consumption Possibilities
  - The combinations of goods and services
    that a country’s citizens might feasibly
    consume

Production and Consumption Possibilities and the Benefits of Trade

- In a closed economy:
  - Society’s production possibilities =
    consumption possibilities.
  - If a country is self-sufficient, it is called
    autarky.
Production and Consumption Possibilities and the Benefits of Trade

- In an open economy:
  - The society’s consumption possibilities are typically greater than its production possibilities.

Brazil’s Consumption Possibilities with Trade

Computers (number/year) | Coffee (pounds/year)
--------------------------|------------------------
100                      | 10,000
150                      | 5,000
200                      | 1,000
250                      | 0

Production possibilities:
- Slope = -50 pounds coffee/computer
- Slope = -100 pounds coffee/computer

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Consumption Possibilities Curve for a Many-Worker Economy

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200                      | 1,000
250                      | 0

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Economic Naturalist
- Does “cheap” foreign labor pose a danger to high-wage economies?
Production and Consumption Possibilities and the Benefits of Trade

Economic Naturalist
- Scenario
  - U.S. and Fredonia produce software and beef.
  - Real wages in Fredonia are lower than in the U.S.
  - Fredonia is half as productive as the U.S. in beef production.
  - Fredonia is one-tenth as productive in software production.

Production and Consumption Possibilities and the Benefits of Trade

Economic Naturalist
- Outcome
  - Fredonia has a comparative advantage in beef.
  - U.S. has a comparative advantage in software.
  - The U.S. will trade software for beef and increase its consumption of both.
  - Employment in the software industry in the U.S. increases and employment in the beef industry will decrease.

Consumption Possibilities Curve for US

The Market for Computers in Brazil

A Supply and Demand Perspective on Trade

If the price of a good or service in a closed economy is greater than the world price, and that economy opens itself to trade, the economy will tend to become a net importer of that good or service.
A Supply and Demand Perspective on Trade

- If the price of a good or service in a closed economy is lower than the world price, and that economy opens itself for trade, the economy will tend to become a net exporter of that good or service.

A Supply and Demand Perspective on Trade

- Observations of the Mutually Beneficial Gains from Trade
  - Countries will profit by exporting the goods and services for which they have a comparative advantage.
  - The revenue from the exports are used to import goods and services for which they do not have a comparative advantage.

A Supply and Demand Perspective on Trade

- Observations of the Mutually Beneficial Gains from Trade
  - The markets will ensure that goods will be produced where opportunity cost is lowest.
  - The consumption possibilities will be maximized.

A Supply and Demand Perspective on Trade

- Winners and Losers from Trade
  - Winners
    - Consumers of imported goods
    - Producers of exported goods
  - Losers
    - Consumers of exported goods
    - Producers of imported goods

The Market for Computers after the Imposition of an Import Tariff

- Protectionism
  - The view that free trade is injurious and should be restricted
- Tariff
  - A tax imposed on an imported good
- Quota
  - A legal limit on the quantity of a good that may be imported
The Market for Computers after the Imposition of an Import Tariff

A Supply and Demand Perspective on Trade

- **Tariffs**
  - The market for computers in Brazil:
    - **Demand** \( Q^D = 3,000 - 0.5 P_C \)
    - **Supply** \( Q^S = 1,000 + 0.5 P_C \)

- **Closed economy**
  - Equilibrium price:
    \[
    1,000 + 0.5 P_C = 3,000 - 0.5 P_C
    \]
    \[ P_C = $2,000 \]
  - Equilibrium quantity:
    \[
    1,000 + 0.5(2,000) = 2,000 \text{ computers/yr}
    \]

- **Open economy**
  - \( P = \text{world price} = $1,500 \)
  - \( q_d = 1,000 + 0.5(1,500) = 1,750 \)
  - \( q_s = 3,000 - 0.5(1,500) = 2,250 \)
  - \( \text{Imports} = 2,250 - 1,750 = 500 \text{ computers/yr} \)

- **Tariffs imposed**
  - Tariff = $300/computer
  - \( P = \text{world price} + \text{tariff} = $1,500 + $300 = $1,800 \)
  - \( q_d = 1,000 + (0.5)(1,800) = 1,900 \text{ computers/yr} \)
  - \( q_s = 3,000 - (0.5)(1,800) = 2,100 \)
  - \( \text{Imports} = 2,100 - 1,900 = 200 \)
  - Tariff revenue = $300/computer \times 200 \text{ computers/yr} = $60,000/yr
The Market for Computers after the Imposition of an Import Quota

- Impact of quota = impact of tariff
- Revenue from quota goes to the producer

A Supply and Demand Perspective on Trade

- Quotas & Tariffs
  - Market effects of tariffs are the same.
  - Tariffs generate tax revenue.
  - Quotas generate revenue for the firms that hold an import license. Or (rents), if they bribe officials to get the license (eg in LDCs)

A Supply and Demand Perspective on Trade

- Effects of an import Quota
  - Without quota:
    - $q_S = 1,000 + 0.5P_C$
  - With a quota of 200 computers
    - $q_S = 1,000 + 0.5P_C + 200 = 1,200 + 0.5P_C$
    - $q_D = 3,000 - 0.5P_C$
    - Equilibrium = $1,200 + 0.5P_C = 3,000 - 0.5P_C$
    - Equilibrium price = $1,800$

A Supply and Demand Perspective on Trade

- Effects of an import Quota
  - With a quota of 200 computers
    - Domestic quantity supplied
      - $1,000 + 0.5(1,800) = 1,900 computers/yr$
    - Domestic quantity demanded
      - $3,000 - 0.5(1,800) = 2,100 computers/yr$
    - Imports = $2,100 - 1,900 = 200$
    - Revenue to the importers
      - $(1,800 - 1,500) x 200 = 60,000$

A Supply and Demand Perspective on Trade

- Other Barriers to Trade
  - Red-tape barriers
  - Regulations

A Supply and Demand Perspective on Trade

- The Inefficiency of Protectionism
  - Trade barriers are inefficient and reduce the size of the economic pie.
  - Because trade barriers benefit certain groups, and these groups may be well organized, they may be successful in lobbying for trade barriers.
  - The gains from trade could be used to assist groups that have been hurt by trade.