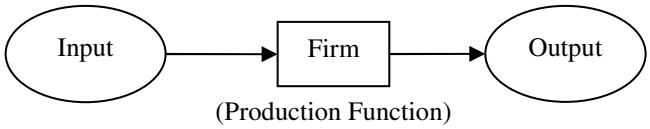
Lecture #9 – Monday, November 10, 2003

THEORY OF THE FIRM

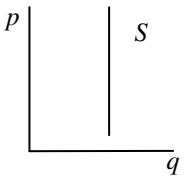


(Production Function)

- Firms want to maximize profits.
- $q = q(K, L)$.

Time Periods

- Very short run: both factors fixed.
- $\overline{q} = q(\overline{K}, \overline{L})$



- Short run: one factor fixed.
- Long run: two inputs vary.
- Very long run: technology varies – the function itself varies.

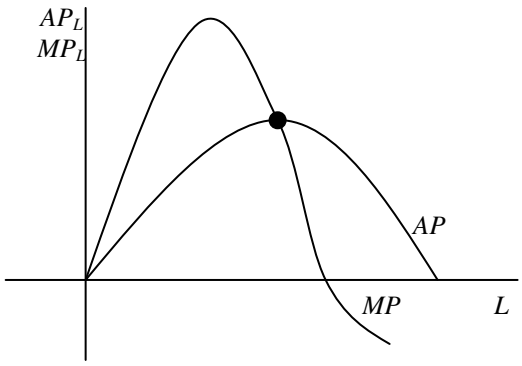
- $q = q(\overline{K}, L)$
- $q = q(K, L)$
- $q = \hat{q}(K, L)$

Relate to Costs of Production

- $TC(q) = \overline{p_K} \cdot K + p_L \cdot L$.
- In the short run, $TC_{SR} = \overline{p_K} \cdot \overline{K} + \overline{p_L} \cdot L = \text{Total Fixed Cost} + \text{Total Variable Cost} = \text{TFC} + \text{TVC}$.

Short Run Productivity Curves

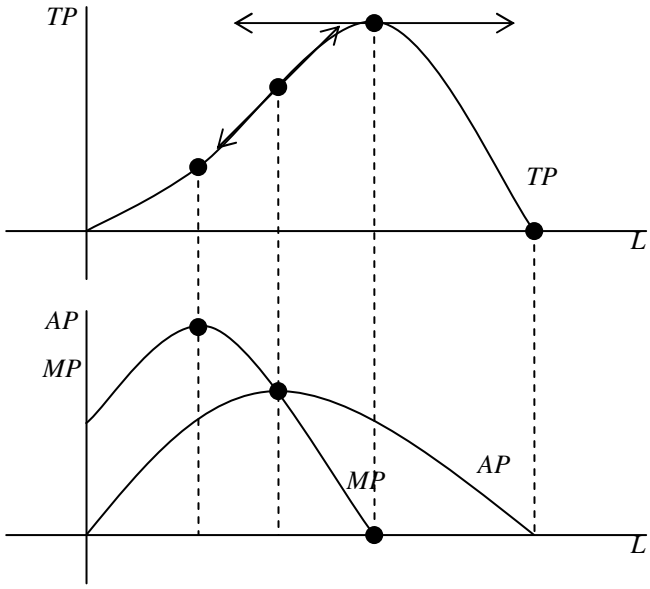
- $q_{SR} = q(\overline{K}, L) = \text{Total Product of Labour}$.



- $AP = MP$ where AP is maximum.
- When AP is rising, MP is above it.
- When AP is falling, MP is below it.

Lecture #10 – Monday, November 17, 2003

- $TP_L = q(\overline{K}, L)$
- $AP = \frac{TP}{L}$
- $MP = \frac{\Delta TP}{\Delta L}$

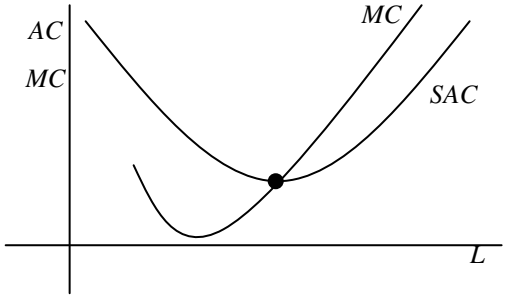


COST CURVES

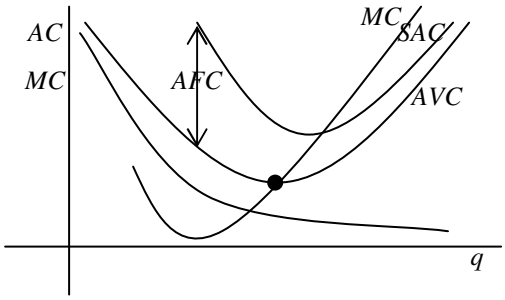
- $TC_{SR} = \overline{P_K} \cdot K + \overline{P_L} \cdot L = TFC + TVC$

Example

$TC = \$500 \times 1 + \$100L$



- U-shaped cost curves – Law of Diminishing (Marginal) Return



- $AFC = \frac{TFC}{q}$
- $AVC = \frac{TVC}{q}$
- $\frac{TC_{SR}}{q} = \frac{TFC}{q} + \frac{TVC}{q} \Leftrightarrow SAC = AFC + AVC$

PROFITS

- $\pi = TR - TC$

Nature of Costs: Accounting Costs vs. Economic Costs

- Manager's salary
  - TR = \$500000
  - TC = \$450000 – including \$25000 manager's salary.
  - "Profits" = \$50000
  - Adjust: \$25000
  - Economic π: \$25000
- Interest imputation adjustment
  - Adjust \$10000
  - Economic π: \$15000

- $\pi = TR - TC$ – TC where every input paid its opportunity cost
- $\pi = 0$ – business making its proper return (normal rate of return)
- $\pi > 0$ – attractive, should go into business
- $\pi < 0$ – economic loss

PROFIT MAXIMIZATION

Produce or Not? Loss Minimization

Q	TVC	TR	Profits
0	\$ -	\$ -	-\$ 100.00
1	\$ 2.00	\$ 10.00	-\$ 92.00
2	\$ 4.00	\$ 20.00	-\$ 84.00
3	\$ 6.00	\$ 30.00	-\$ 76.00

Q	TVC	TR	Profits
0	\$ -	\$ -	-\$ 100.00
1	\$ 20.00	\$ 10.00	-\$ 110.00
2	\$ 40.00	\$ 20.00	-\$ 120.00
3	\$ 60.00	\$ 30.00	-\$ 130.00

- As you produce more, you reduce the loss – produce positive quantity.
- As you produce more, you increase the loss – produce nothing.

- Produce when $TR > TVC$.
- Rule #1: Produce when $\frac{TR}{q} > \frac{TVC}{q} \Leftrightarrow p > AVC$.

Profit Maximizing Quantity

- Rule #2: For π_{max}, $MR = MC$

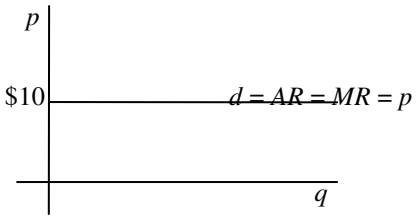
INDUSTRY STRUCTURES

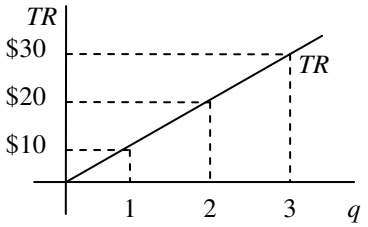
Monopoly: one firm | Duopoly: two firms | Oligopoly | Monopolistic Competition | Perfect Competition: large number of firms

PERFECT COMPETITION

Assumptions

1) Every firm in competition is price taker – a firm on its own cannot influence the price.



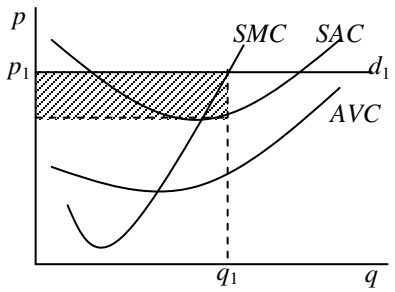


2) Free Entry – New firms can enter without barriers.
   - Occurs when $\pi > 0$.
   - Occurs in the long run.
   - Same cost curves (usually).

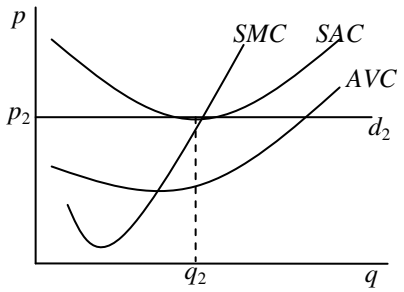
General Profit Maximization Rule in Perfect Competition

1) $MR = MC$
2) $p = MC$

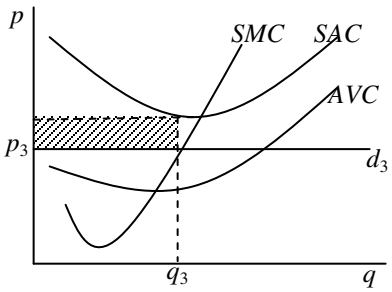
Applying The Profit Maximization Rule



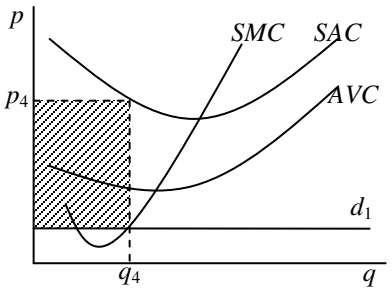
- Produce q_1 for π_{max} ($P = MC$)
- $\pi = q_1(p - ac)$



- $\pi = 0$ ($p = ac$)
- $p > AVC$ – produce at q_2

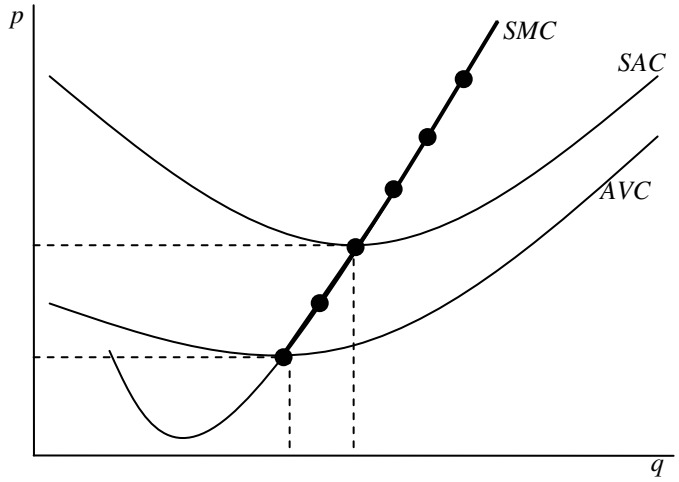


- $\pi < 0$
- produce q_3 – $p > AVC$
- $TFC >$ losses



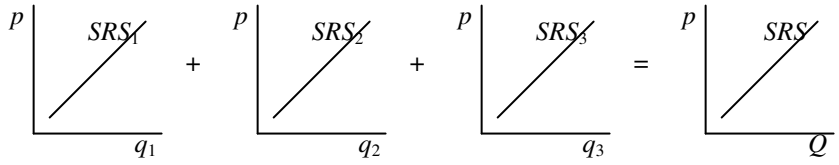
- produce nothing – $TFC <$ losses

Summary



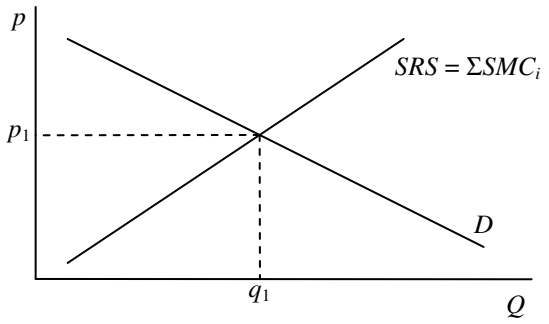
- *SRS* = *SMC* above *AVC* (will produce along *SMC*)

Industry Short Run Supply Schedule

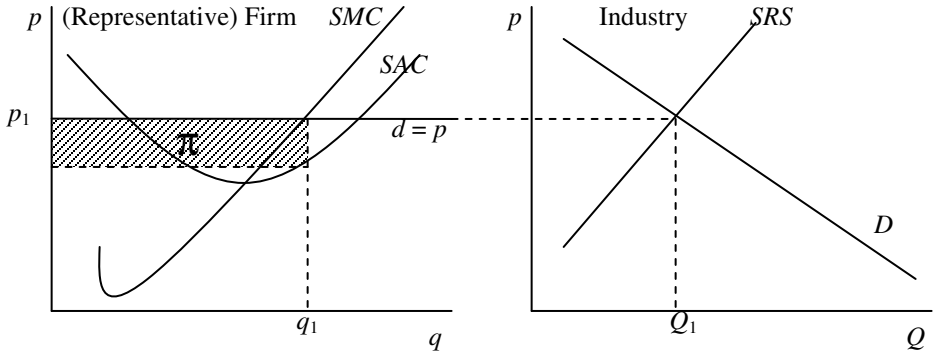


- Industry Supply = $n \times$ supply curve for one firm

Industry Equilibrium



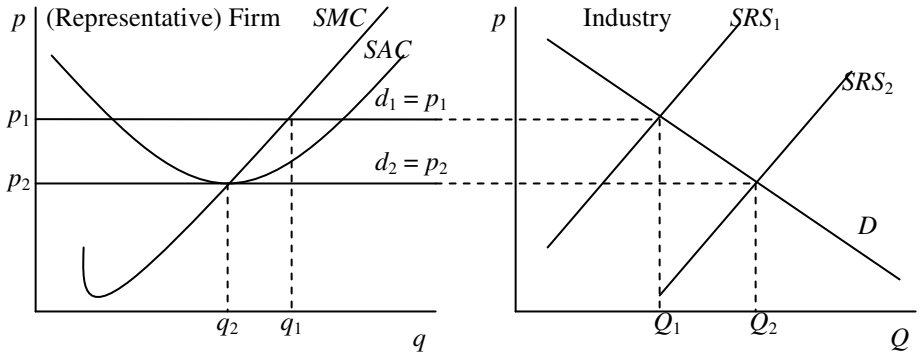
Short Run Equilibrium



- $Q_1 = n_1 \cdot q_1$
- Maximum profit where $p = MC$.

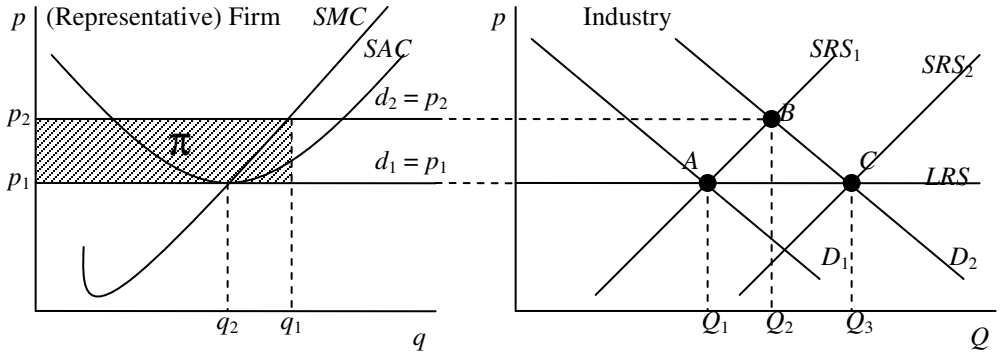
Long Run Equilibrium

- $\pi > 0$, so new firms enter.
- SRS_{industry} shifts to the right until $p = AVC$.



- Firms enter until $\pi = 0 \Rightarrow p = AVC$.
- Long-run equilibrium: $Q_2 = n_2 \cdot q_2$.

Disturbance

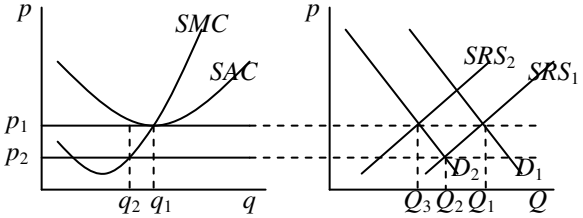


- D increases.
- New firms enter with same cost curves of the original firms – constant cost industry.

Lecture #12 – Monday, December 1, 2003

Long-Run Equilibrium

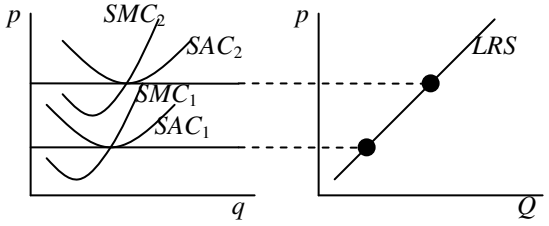
Constant Curve Industry



One Firm Industry

- Allocation Efficiency – $p = MC$.
- Production Efficiency – In the long run, AC is minimum.

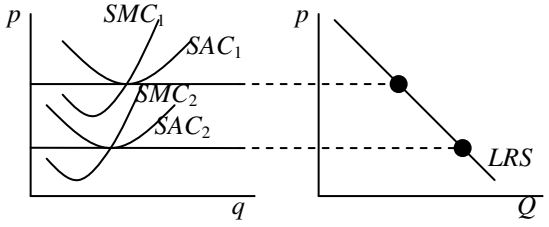
Increasing Cost Industry



One Firm Industry

- Costs (ex: labour) goes up as the industry expands.
- Production function changes.

Decreasing Cost Industry

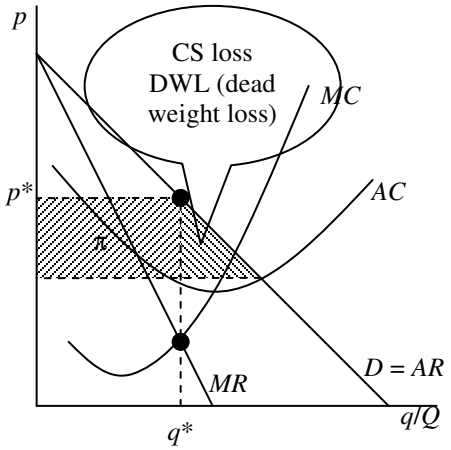


One Firm Industry

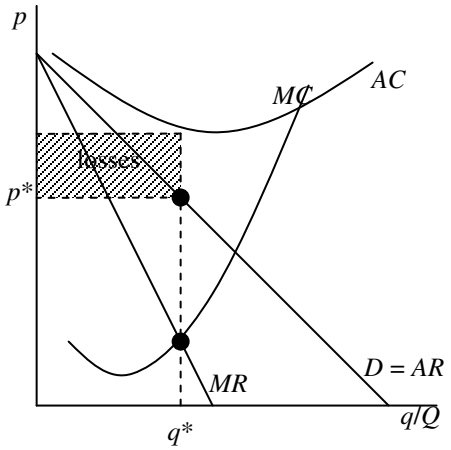
- As industry expands, everyone's costs decrease.

MONOPOLY

- One firm = The industry ($d = D$).
- The firm is not a price-taker – it can choose where to be on the demand schedule.
- Barriers to entry of new firms:
  - Rivals driven out (natural monopoly) – cost advantage of the large firm.
  - Government interventions – licences and patents.



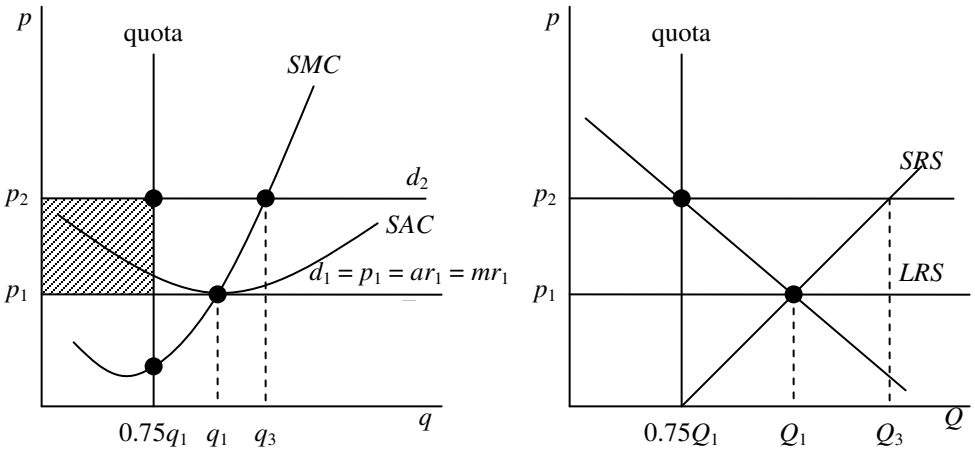
- $MR = MC$: general rule for maximum profit.
  - $MR = p_2 -$ lower price $\times$ previous units



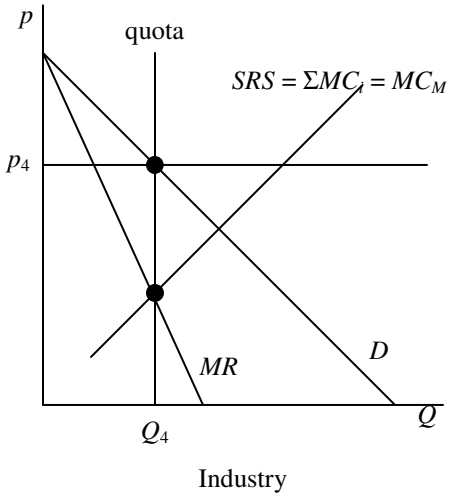
- Just because you got market power (price control) or monopoly position, you are not guaranteed profits.

Lecture #13 – Monday, January 5, 2004

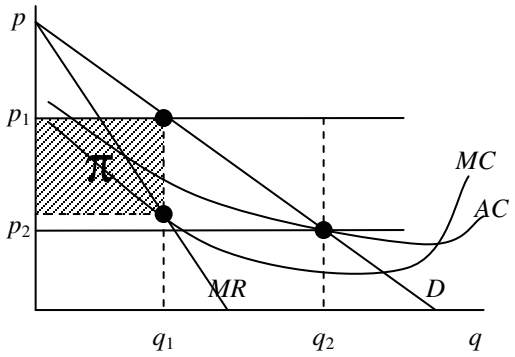
Cartel Arrangements Under Perfect Competition



- Each firm has incentive to cheat – not maximizing profits.
- Firms will move to q_3, causing the industry to move to Q_3. This causes surplus/excess.
- $0.75q_1$ is not optimum – $MC = MR$.

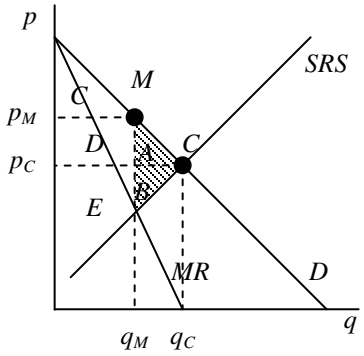


NATURAL MONOPOLY



- *AC* is decreasing for all relevant range.
- If there are large number of small firms, *AC* is high for each firm.
- Needs to over-rule the *MC* = *MR* monopoly situation (not much different than perfect competition).
- Since *MC* < *AC*, then if *P* = *MC* there will be losses.
- Set *P* = *AC*, then π = 0 – output at lowest possible cost.

ALLOCATIVE EFFICIENCY



Perfect Competition	Monopoly
CS = *A* + *C* + *D*	CS = *C*
PS = *B* + *E*	PS = *D* + *E*
Total = *A* + *B* + *C* + *D* + *E*	Total = *C* + *D* + *E*

- *A* + *B* = Dead Weight Loss (DWL)

ROLE OF GOVERNMENT

Competition: Positive Attributes

- Allocative efficiency: *P* = *MC*
- Production efficiency: minimum *AC*
- Decentralized
- Responsive
- Has incentives

Reasons for Interventions

- Market Failures: Externalities/3rd party effects (private costs vs. social costs), natural monopolies, market power (enterprise collude), pure public/collective consumption goods, asymmetric information/orderly markets.
- Income Distribution: Tax-subsidy scheme, minimum wages.
- Social Norms: Number of working hours.
- Merit Goods (or "Bads"): What society believes should have more than the equilibrium (or less than).

	Exclude	Non-Excludable
Rivalrous	Ordinary Goods	Common Properties • Fisheries

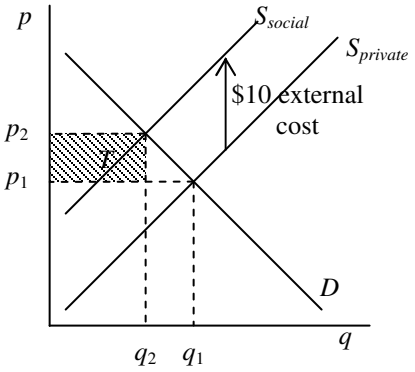
Non-rivalrous	Quasi-Public Goods • Roads, bridges, museums • $MC = 0 = p$	Public Goods • National defence, public protection, public information

- Government would intervene with every categories except the "Exclude-Rivalrous" category.

Instruments For Intervention

- Regulation.
- Expenditure.
- Taxation/subsidy.

Taxation/3rd Party Effect



- Market failure: social equilibrium vs. private equilibrium
- Government could tax and repay those who were harmed.

TRADE

Why Trade?

- Get beyond the PPF by specialization.
- Not self-sufficient – do what one does best.

Absolute Advantage

- Assumptions:
  - Two countries: Canada, Russia.
  - Two goods: wheat, vodka.
  - Labour is the only input.
  - No transportation costs.
  - Ignore exchange rates.
  - Both countries initially producing both goods.

- Production information:

	Output per 1 Labour	
	Wheat (bushels)	Vodka (bottles)
Canada:	30 ($1/6V$)	5 ($6W$)
Russia:	10 ($2V$)	20 ($1/2W$)

- Canada has absolute advantage in the production of wheat.
- Russia has absolute advantage in the production of vodka.

- Reallocation of labour:

Output per 1 Labour

	Wheat (bushels)	Vodka (bottles)
Canada ($1L_V \rightarrow 1L_W$):	+30	-5
Russia ($1L_W \rightarrow 1L_V$):	-10	+20
World:	+20	+15

- Opportunity cost for a bottle of vodka in Canada is $6W$; opportunity cost for a bottle of vodka in Russia is $1/2W$ – opportunity cost for a bottle of vodka is much lower in Russia.
- Opportunity cost for a bushel of wheat in Canada is $1/6V$; opportunity cost for a bushel of wheat in Russia is $2V$ – opportunity cost for a bushel of wheat is much lower in Canada.

Comparative Advantage

- Change the data:

	Output per 1 Labour	
	Wheat (bushels)	Vodka (bottles)
Canada:	30 ($2/3V$)	20 ($3/2W$)
Russia:	10 ($1V$)	10 ($1W$)

- Opportunity cost is not the same.

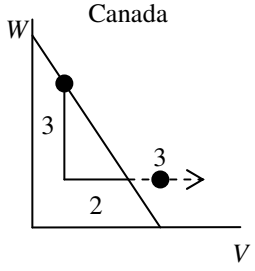
- Reallocation of labour:

	Output per 1 Labour	
	Wheat (bushels)	Vodka (bottles)
Canada ($2L_V \rightarrow 2L_W$):	+60	-40
Russia ($5L_W \rightarrow 5L_V$):	-50	+50
World:	+10	+10

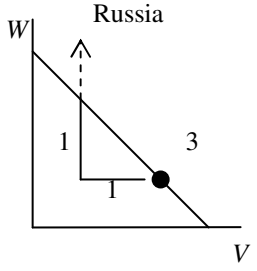
- Price ratios:
  - In Canada, $\frac{P_W}{P_V} = \frac{\frac{1}{30}L}{\frac{1}{20}L} = \frac{2}{3}$.
  - In Russia, $\frac{P_W}{P_V} = \frac{\frac{1}{10}L}{\frac{1}{10}L} = \frac{1}{1}$.
- Wheat is cheaper in Canada. So an entrepreneur would buy wheat from Canada and sell in Russia.

Terms of Trade

	Output per 1 Labour	
	Wheat (bushels)	Vodka (bottles)
Canada:	30	20
Russia:	10	10



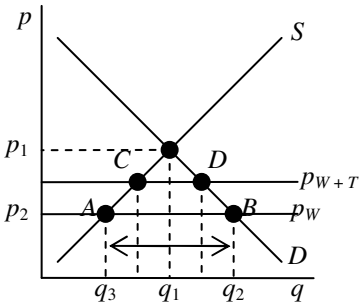
Canada: At least $2V$ for $3W$



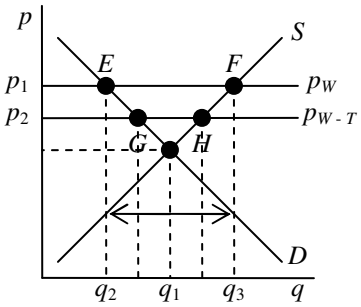
Canada: At least $1V$ for $1W$

Lecture #15 – Monday, January 19, 2004

THEORY OF TRADE – 2ND MODEL



- Imports = *AB*.
- Imports + tariffs = *CD*.



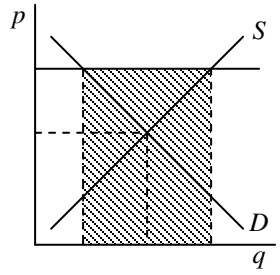
- Export = *EF*.
- Export – tariffs = *GH*.

Impacts of Trade

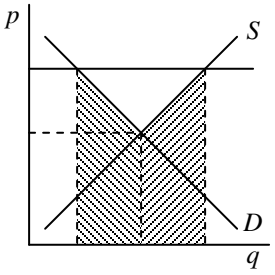
- Consumers win on import, producers lose.
- Producers win on export, consumers lose.

Efficiency and Transfer Effects

- Exports – Efficiency Effect:

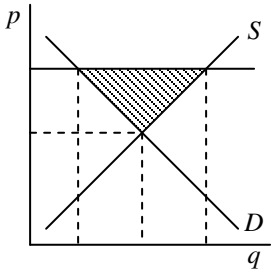


value of export by world



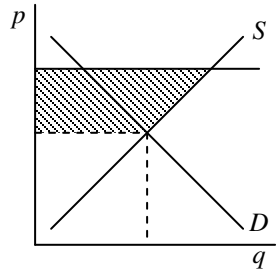
given up by consumers

cost of domestic production

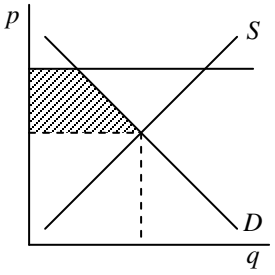


net gain

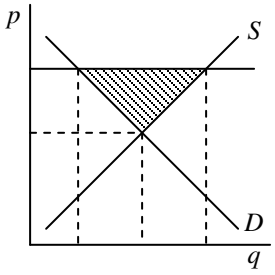
- Exports – Transfer Effect:



producers' gain

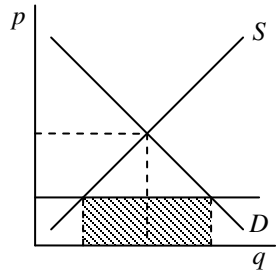


consumer loss

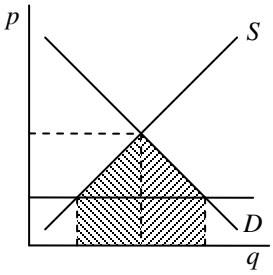


net gain

- Imports – Efficiency Effect:

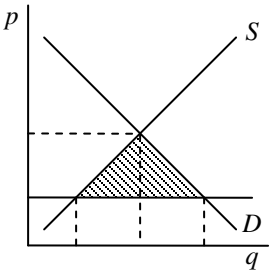


cost of imports



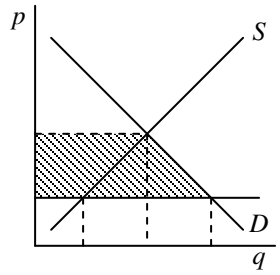
resources savings from reduced production

consumers evaluation of additional units

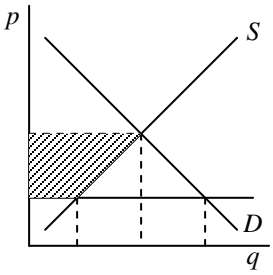


net gain

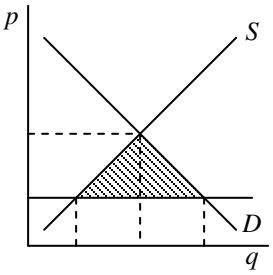
- Imports – Transfer Effect:



consumers' gain



producers' loss



net gain