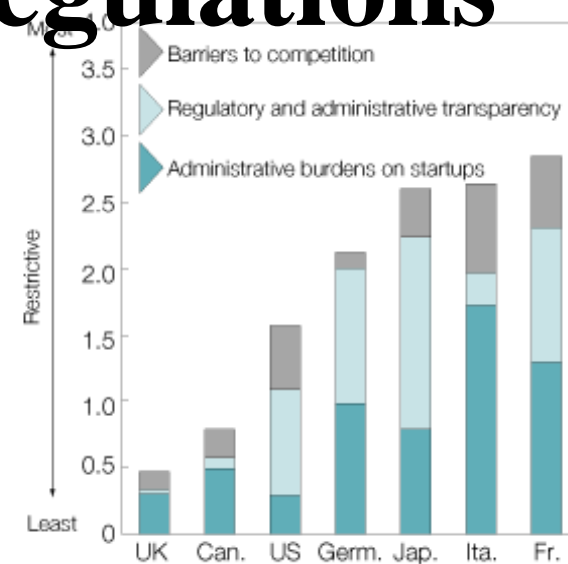


Telecommunications Policy, Economics and Regulations

Figure 2.11

Barriers to Entrepreneurship Among

OECD Countries, 2002



Source: OECD, Summary Indicators of Product Market Regulation with an Extension to Employment Protection Legislation, 2002.

Contents

Economic regulation

Economic efficiency

Supply and Demand

Price elasticity of demand

Social welfare

Economic efficiency in telephony

Pricing based on cost

Theory of monopoly

Sectors of Economy

Public sector:

highway, railroad

Relies on economic **regulation**

Private sector:

resources and prices

Relies on **competition**

Public utility sector:

telephone service, electricity, natural gas

Who, why, how do we regulate?

Who do we regulate?

Regulate those who have **monopoly power** and provide an **essential service or product**

Why?

Because a party with monopoly power over an essential service has both the incentive and ability to **price gauge** (increase) and **discriminate** to whom the product is offered

Avoid overpricing and discrimination

Who, why, how do we regulate?

How?

1. Controlling entry, expansion and exit
prevent uneconomic duplication of facilities
protect subsidies; revenue from long distance flows into local service before breakup

2. Price control

Increase in price = Decrease in QoS

Rate of return regulation;

Limit return (profit) on investment (value of the capital stock)

More regulative than a **price cap**

Who, why, how do we regulate?

3. Limiting profit
4. Preventing discrimination of consumers

Economic Efficiency

Scarcity: the concern of economic theory

How to allocate limited resources?

How can the resources be optimally allocated?

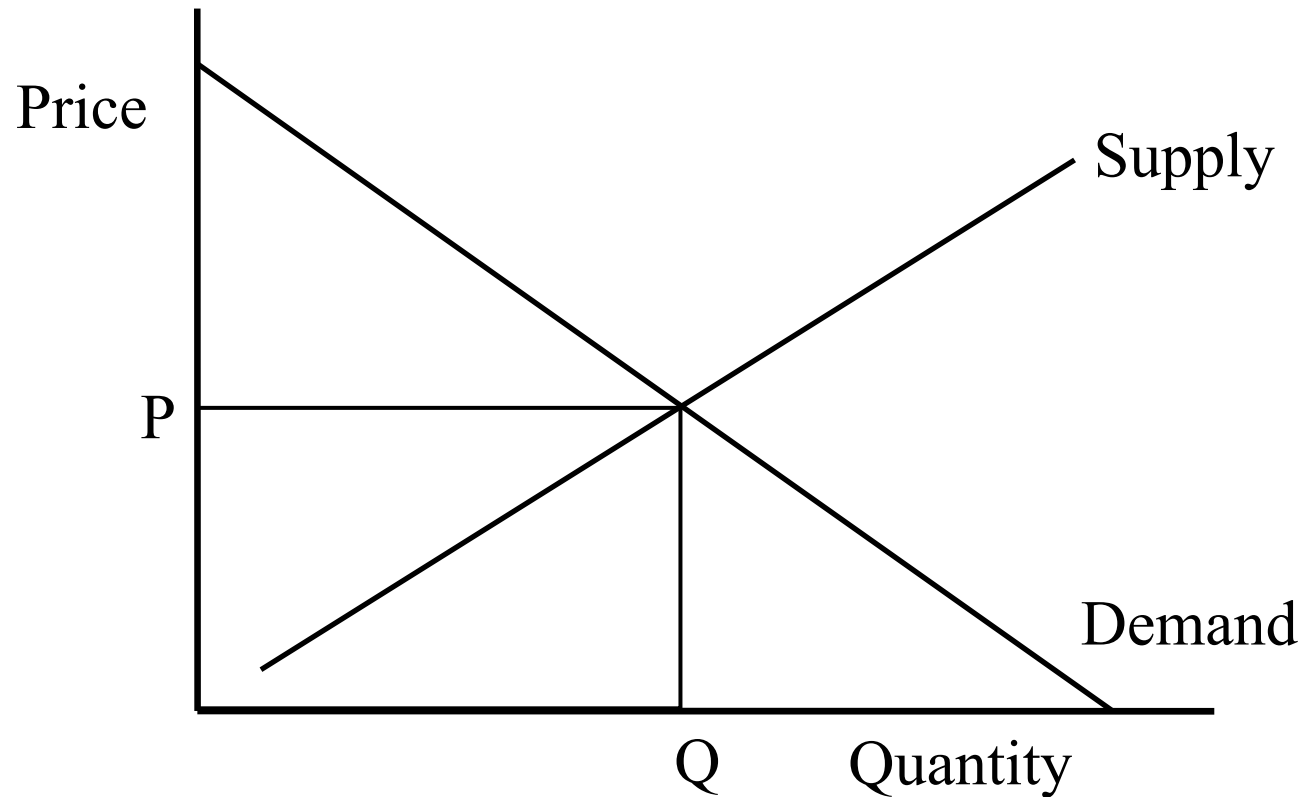
Economic costs: measures the value of resources used

Demand: measures the value of resources (goods and services) to consumers

Consumer's **willingness to pay** (WTP)

Supply and Demand

Determines the allocation of resources



Demand

Measures the value of goods and services

A function of price, income, price of other goods and tastes

Price

Income

Normal good: increase in income shifts demand to the right

Inferior good: the reverse

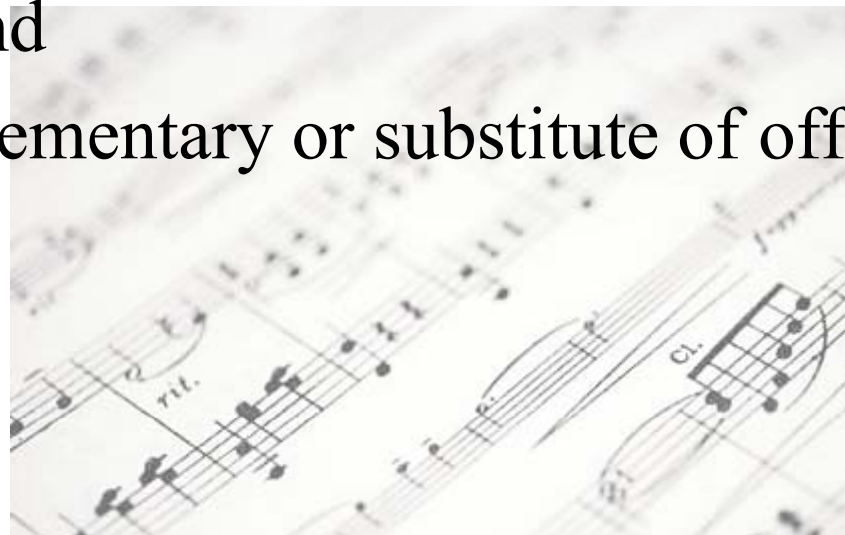
Demand

Price of other goods

Complementary goods: increase in the price of other good decreases the demand

Substitute goods: increase in the price of other good increases demand

Is on-line music complementary or substitute of off-line music?



Price Elasticity of Demand

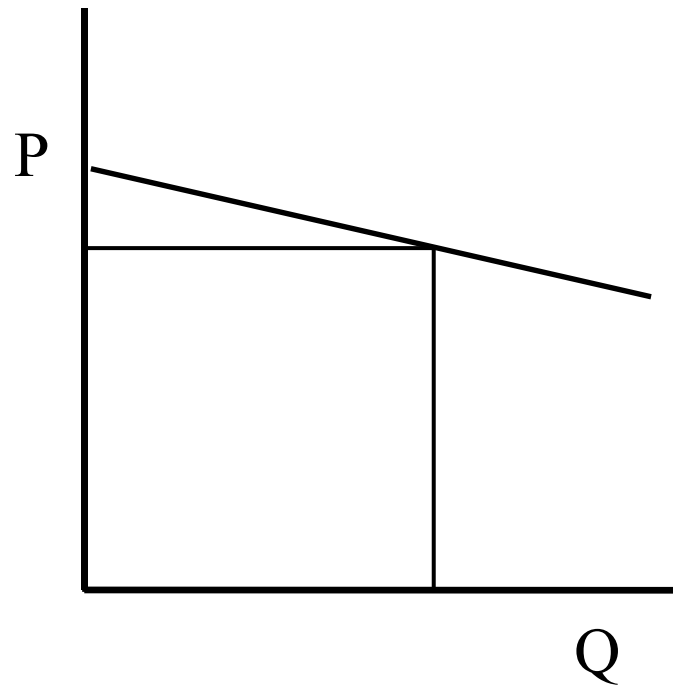
Sensitivity of demand to changes in price

The percentage change in quantity with respect to a percentage change in price

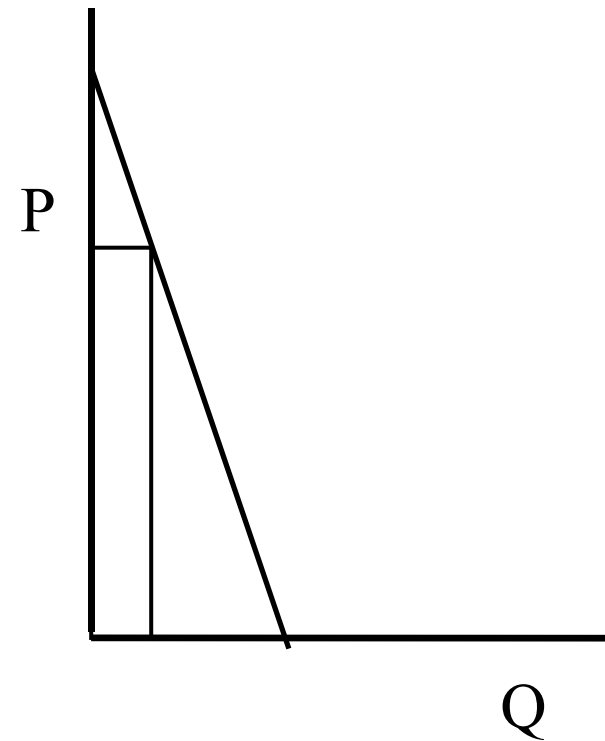
$$\eta = (\Delta Q/Q)/(\Delta P/P) = (\Delta Q/\Delta P)(P/Q)$$

Elastic vs. inelastic

Elastic

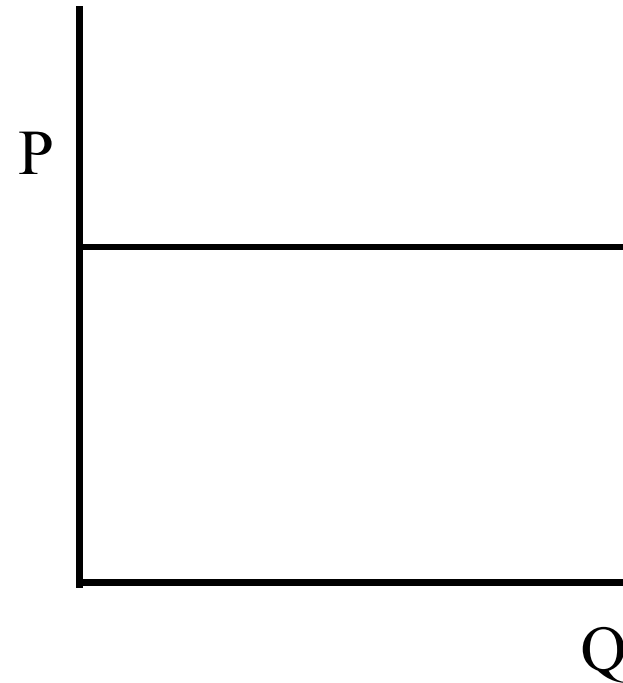
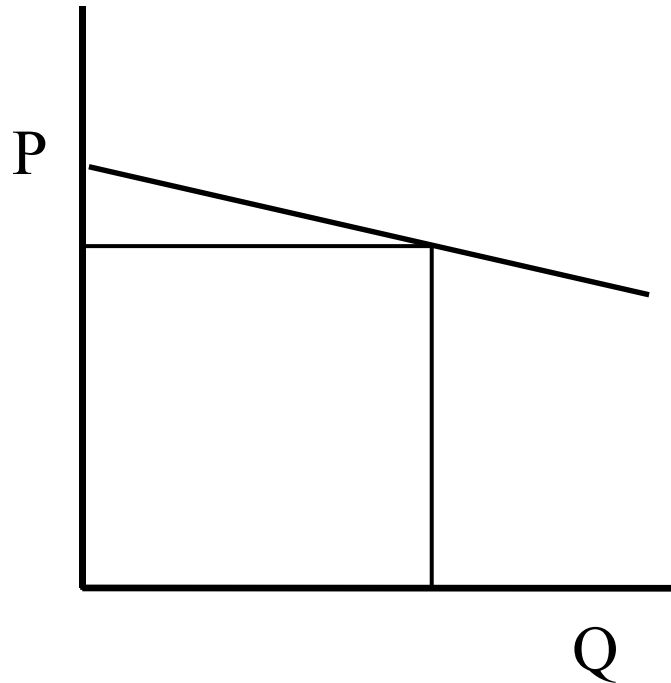


Inelastic



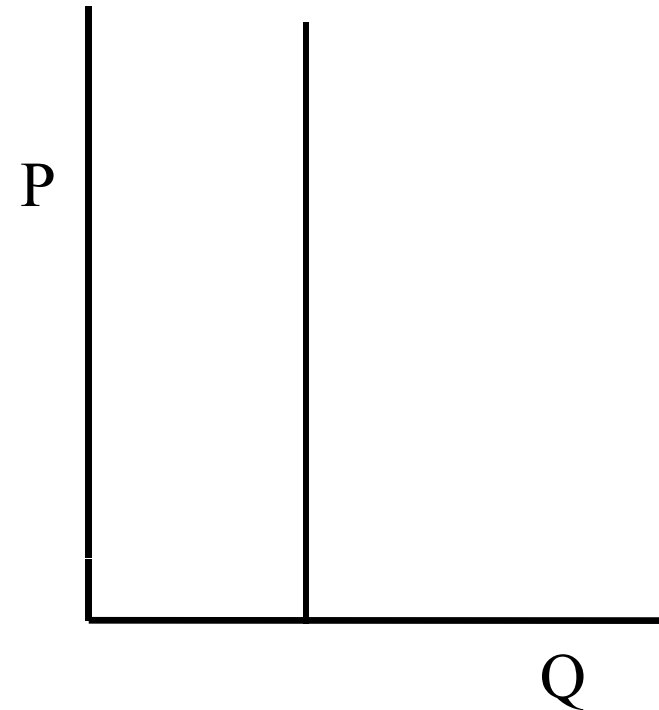
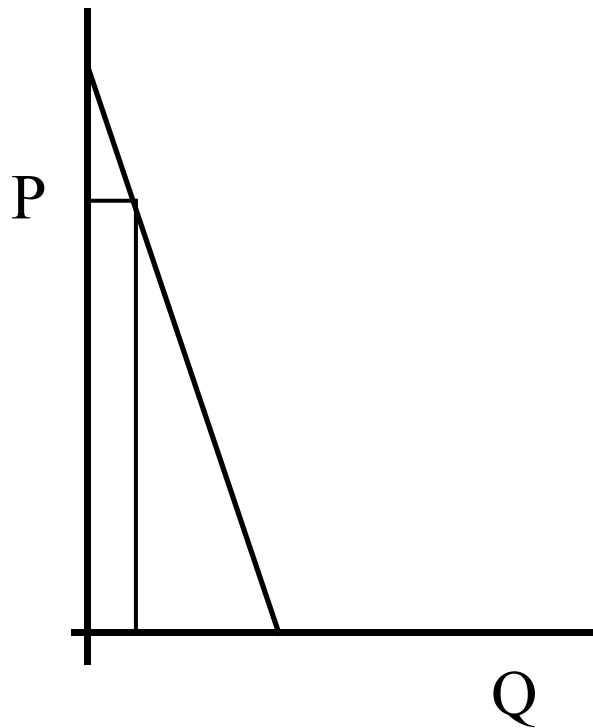
Elastic vs. inelastic

Perfect elastic:
 $\eta = -\text{infinity}$

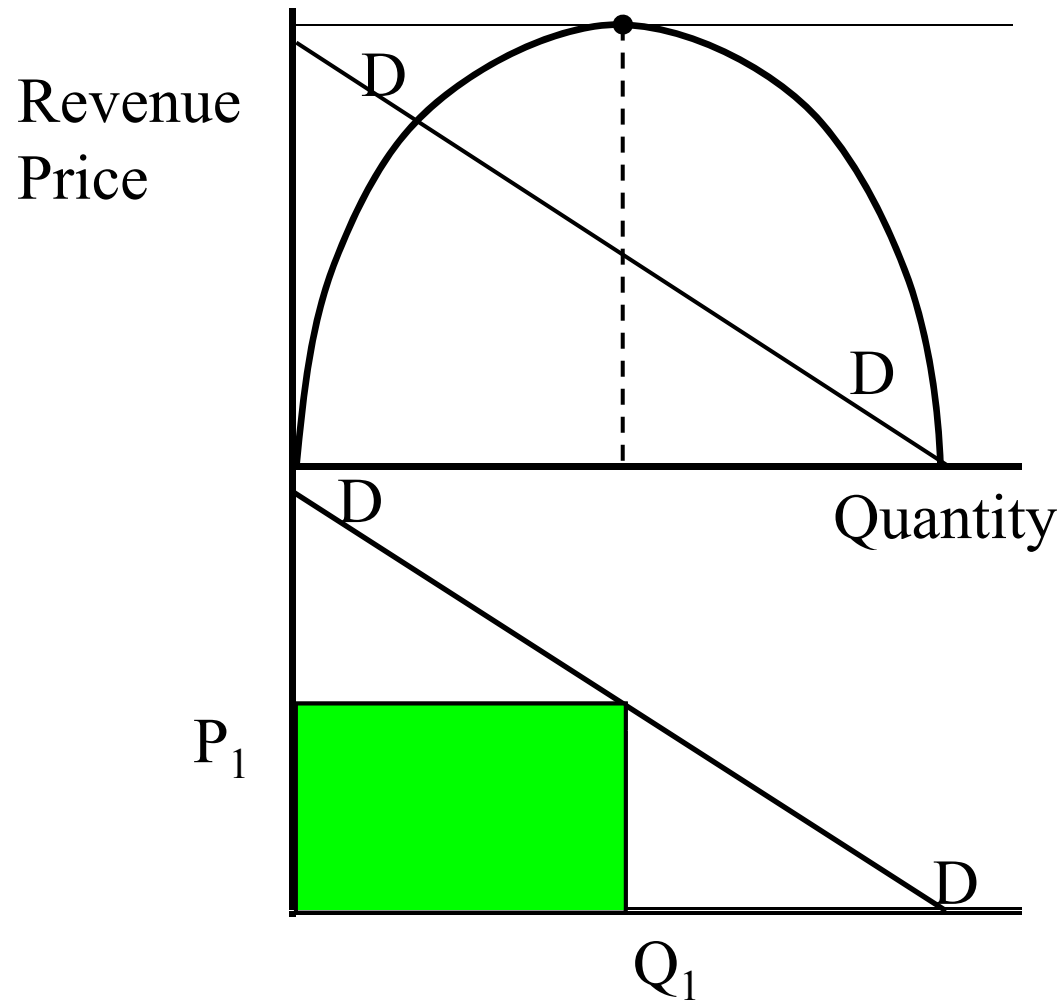


Elastic vs. inelastic

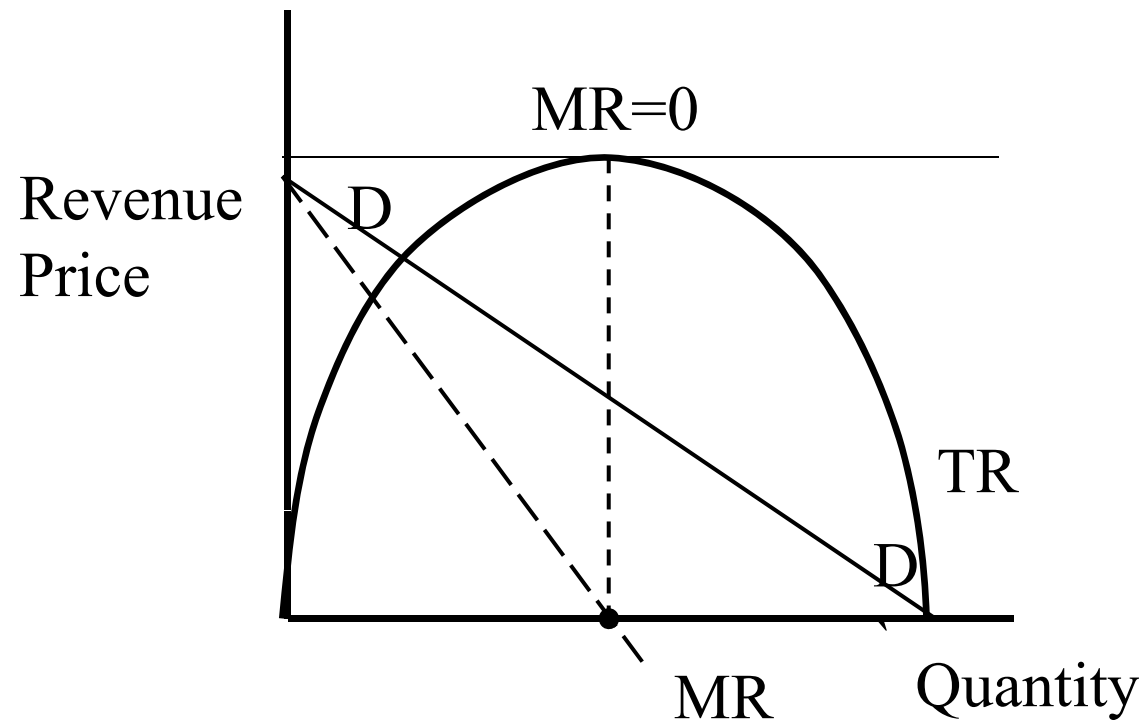
Perfect inelastic:
 $\eta = 0$



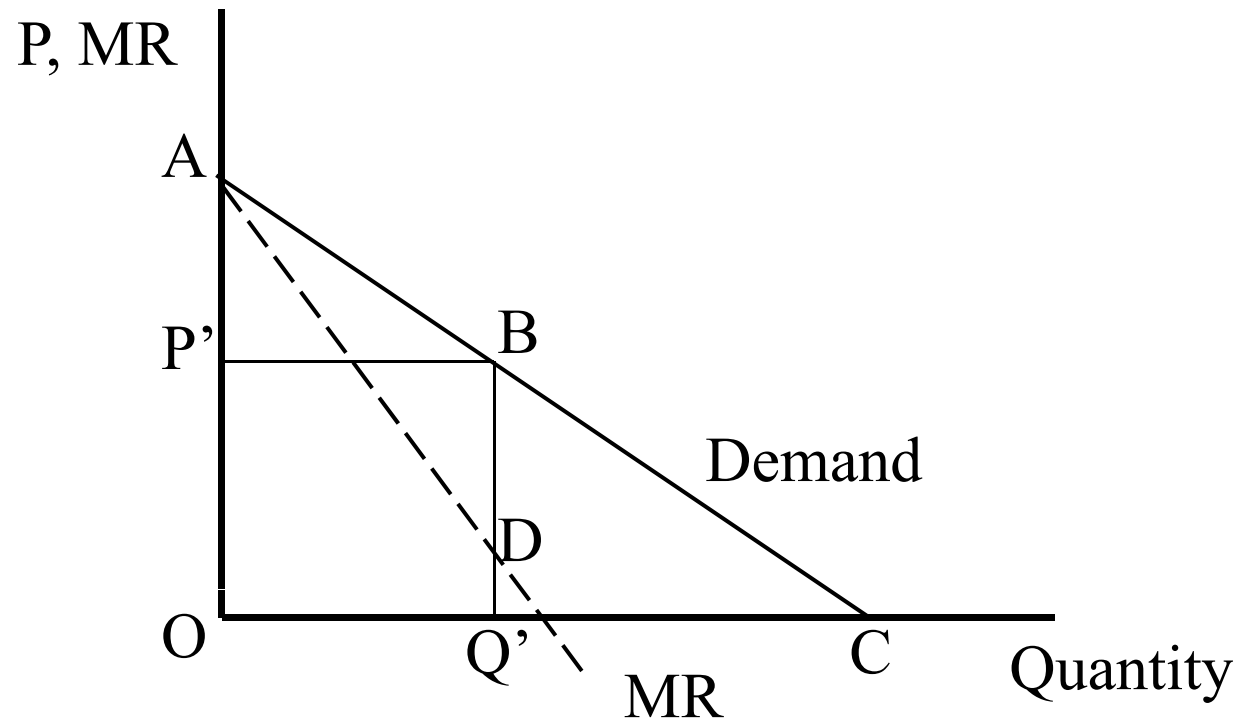
Price, Revenue and Elasticity



Price, Revenue and Elasticity

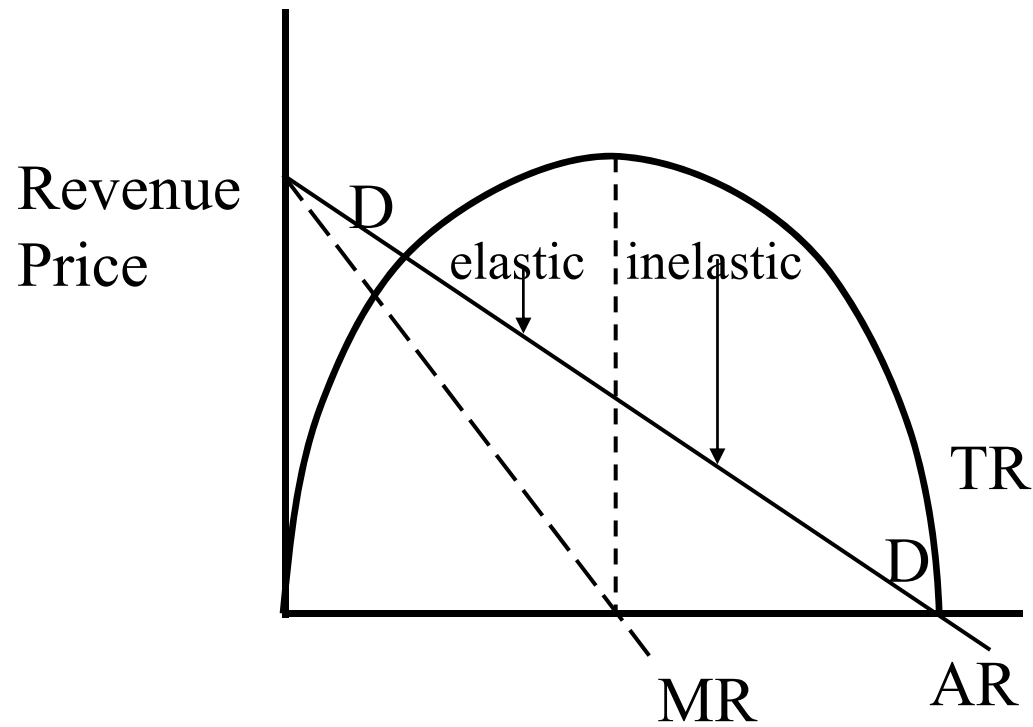


Price, Revenue and Elasticity



$$\begin{aligned}\eta_B &= (\Delta Q/\Delta P)(P/Q) = -(BP'/AP')(OP'/BP') \\ &= -OP'/AP' = -P/(P-MR)\end{aligned}$$

Price, Revenue and Elasticity



Price Elasticity of Demand

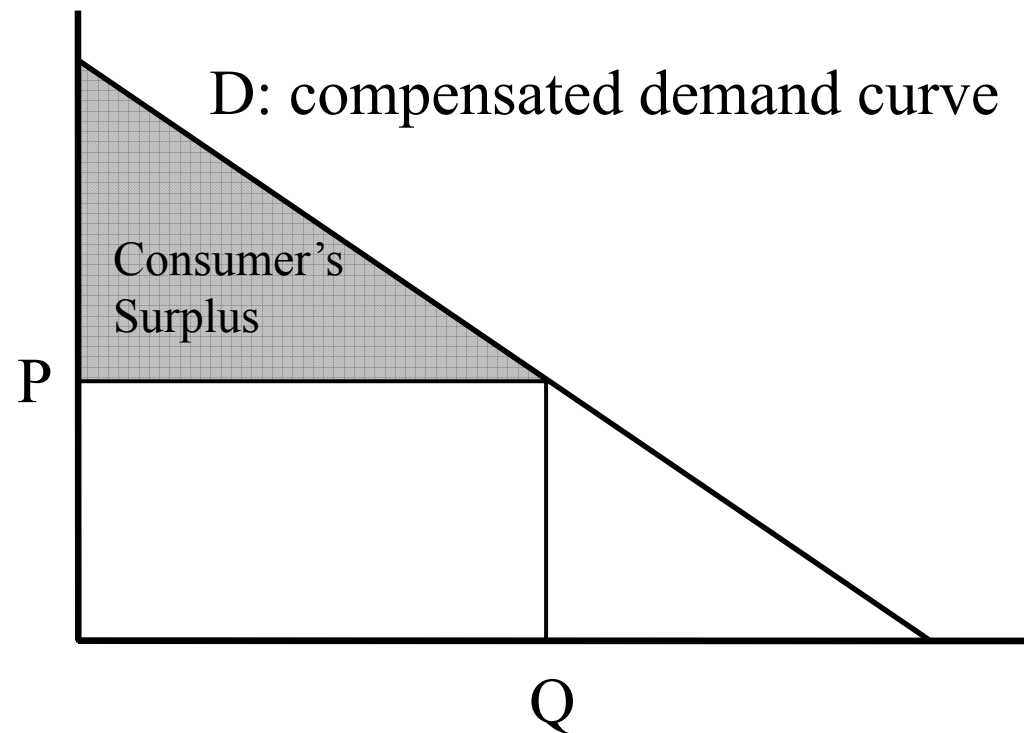
Service	Point estimation
Installation	-0.03
Subscriber access	-0.10
Exchange usage	-0.20
Intra-state toll	-0.65
Inter-state toll	-0.75
International	-0.90

Income Elasticity of Demand

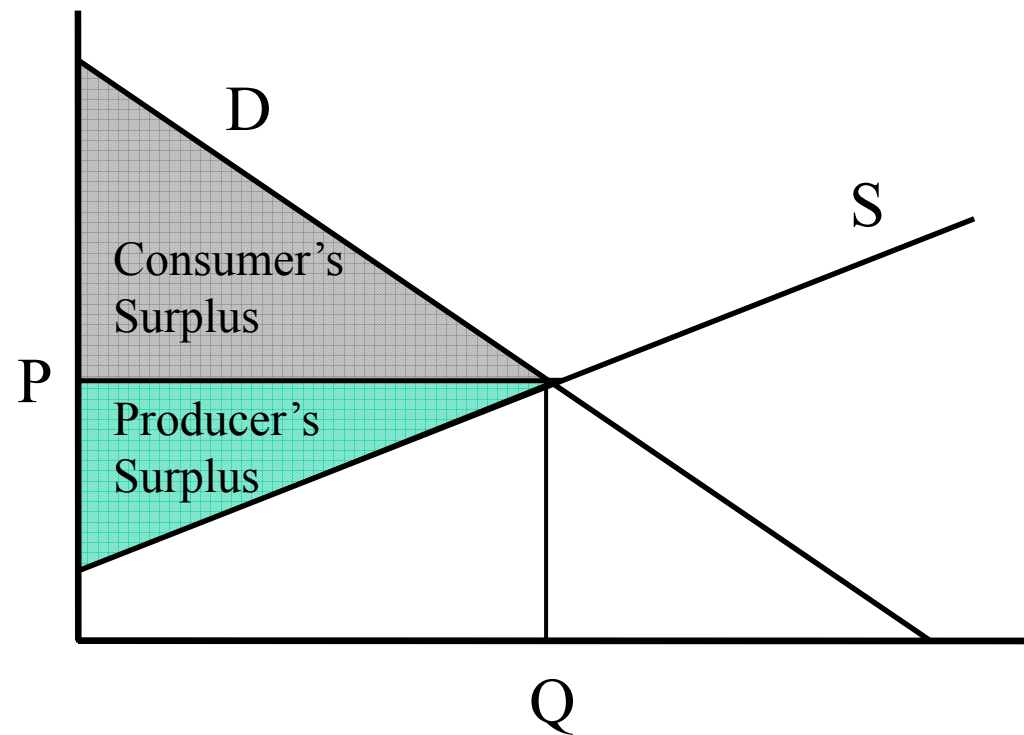
Service	Point estimation
Subscriber access	+0.50
Exchange usage	+1.00
Intra-state toll	+1.25
Inter-state toll	+1.50
International	+1.70

Consumer's surplus

Value beyond which the consumer pays for a good or service: **decreasing marginal benefit**

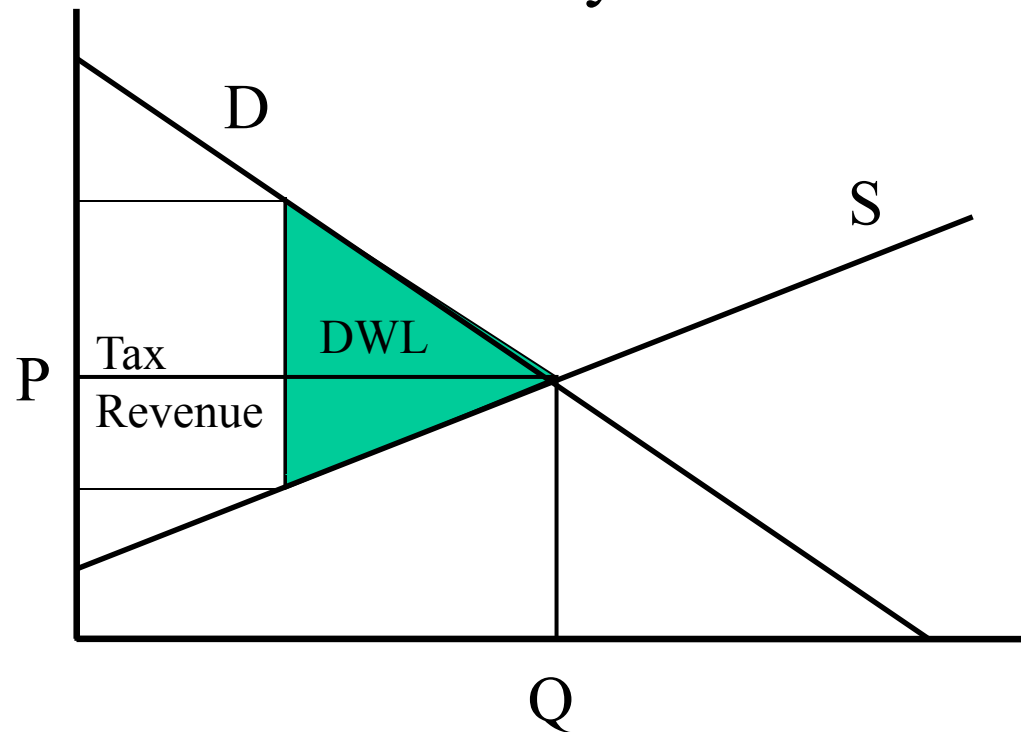


Social welfare = Consumer's surplus
+ Producer's surplus



Deadweight loss (DWL)

If the government taxes a good or restricts its sale
(price ceiling/floor), the welfare is lowered
Loss of economic efficiency



Summary

Sectors of Economy

Regulation

Supply and **Demand**

A function of price, income, price of other goods and tastes

Price elasticity of demand

$$\eta_p = -P/(P-MR)$$

Social welfare

Consumer surplus

Producer surplus

Deadweight loss

Supply

Based on cost

Costs:

fixed vs. variable

relevant (future cost) vs. irrelevant (historic cost)

marginal vs. average

economic (opportunity cost, implicit cost) vs.
accounting (explicit cost)

Supply

Average Cost (AC)

$$AC = TC/Q = TFC/Q + TVC/Q = AFC + AVC$$

Marginal Cost (MC)

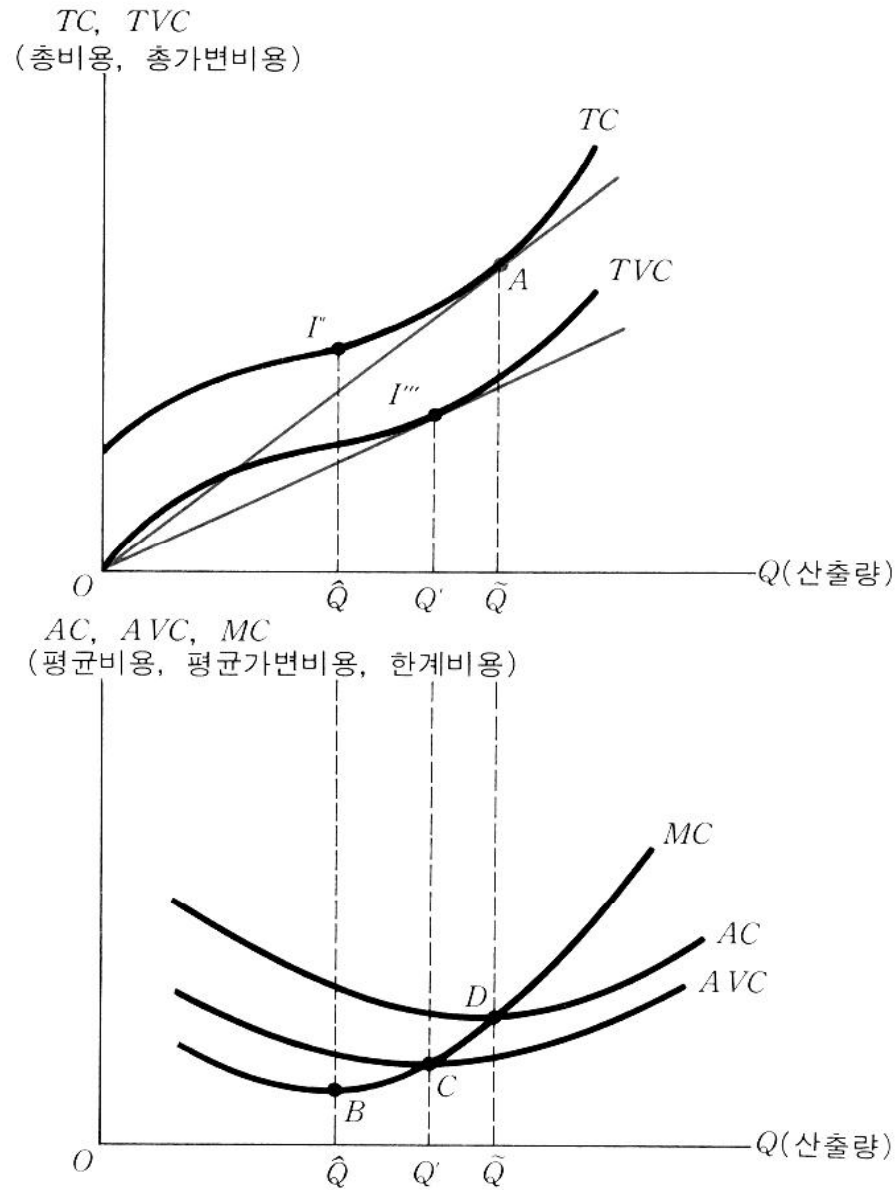
$$MC = dTC/dQ$$

Relevant cost: prospective (future cost),

e.g. spectrum cost

Irrelevant cost: historic cost, e.g. sunk cost

그림 9-10 각종 費用曲線 사이의 상호관계



Telecommunications Demand

Telecommunication service

Subscriber line charge: The Federal Communications Commission authorizes local telephone companies to recover a portion of the costs of the facilities we use to connect your home or business for services through a monthly assessment on all residential and business customers.

Carrier common line charge: LECs are required to charge interexchange carriers a Carrier Common Line charge for every minute of interstate traffic that any of their customers send or receive.

Transport

Switching

Information

Telecommunications Demand

Demand by subscribers' access

Access from CPE to the CO (local loop)

Dependent on usage

Symmetry in calling: calls beget calls

Elasticity increases with distance

Toll and exchange usage

Telecommunications Demand

Externality

Network (subscriber) externality

Network is more valuable by including more subscribers

Rational for subsidizing local exchange service

Call externality

Receive benefit by calling (e.g. 1-800- , 080-)

Economic Efficiency in Telephony

Prices based on costs

Define service correctly

Avoid cross-subsidies

Competition

Economic Efficiency in Telephony

Price based on costs

Marginal cost pricing (1st best pricing)

Ramsey pricing (2nd best pricing)

Other alternatives

Economic Efficiency in Telephony

No cross subsidies

Targeted subsidies, if any

Subsidies financed by government

Cross subsidization

Price discrimination

Charging one group higher rates than another for identical services, e.g. industrial vs. residential users

Same urban and rural phone rates

Economic Efficiency in Telephony

Cross subsidization is present when the average-incremental revenue by a product of a firm is insufficient to cover its average incremental cost, but the firm nevertheless earns sufficient revenue from all its products to cover its cost of capital and other expenses

Some other products of the firm must be priced sufficiently high to bring in the revenue required to offset the shortfall of revenues of the cross-subsidized product

Economic Efficiency in Telephony

Role of competition

Allocation of resources

Incentive for efficiency

Threat of entry discipline

Theory of Monopoly

Monopoly assumes

No substitute

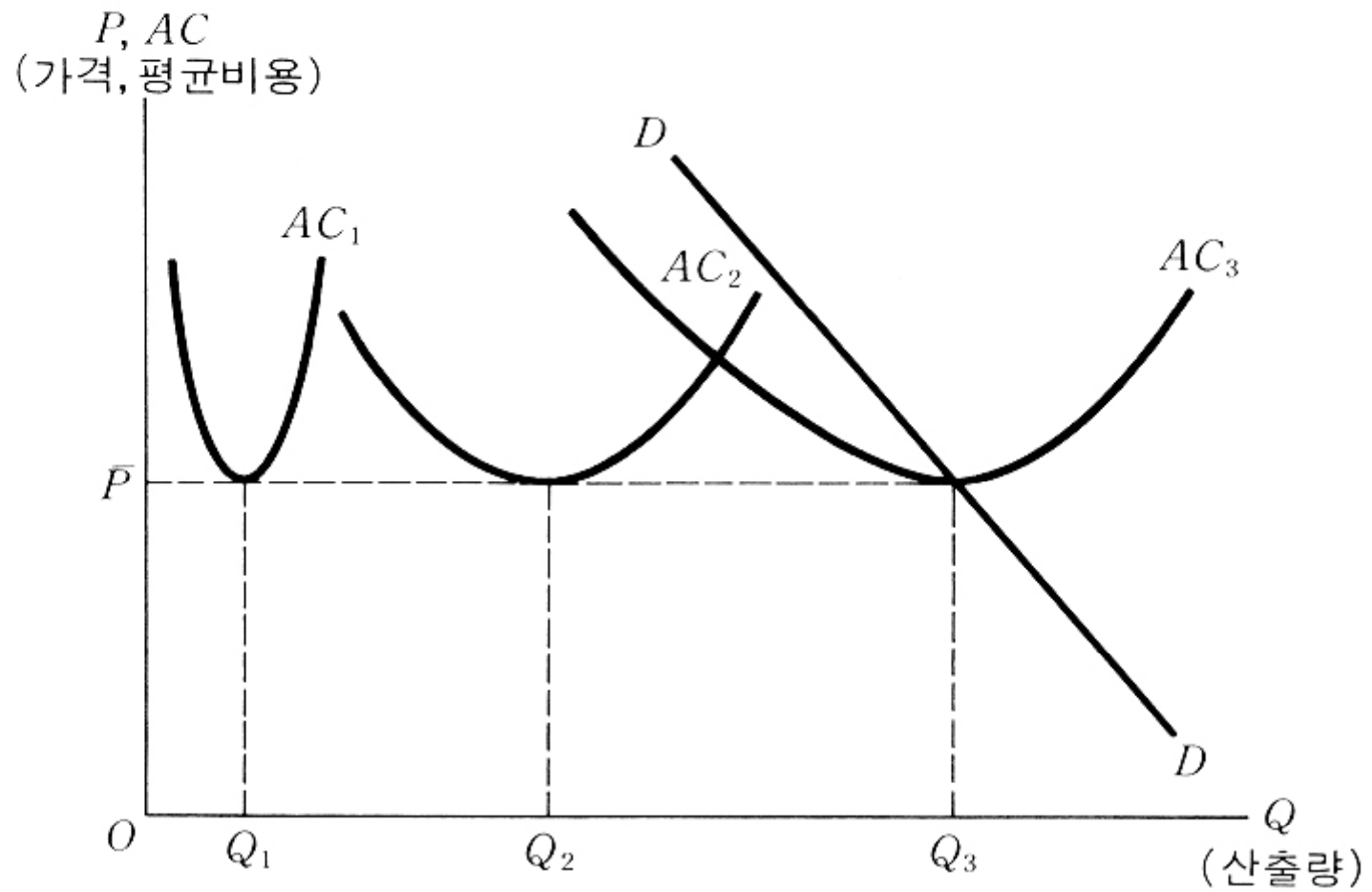
Low price elasticity

Entry barrier

Barrier in supply of inputs

Scale of economy → natural monopoly

그림 12-1 最小效率規模와 시장의 형태



Theory of Monopoly

Economies of scale

Declining unit cost by mass production

AC falls as output increases

Long-run unit fixed cost converges to zero

$f(TC) = Q, f(\alpha TC) > \alpha Q; \alpha > 1$

Scale of diseconomy

Theory of Monopoly

Economies of scope

Declining cost by two or more complementary products

$$p(x+y) \leq p(x) + p(y)$$

Contestable market assumption:

No barrier to entry/exit

Many firms can enter (exit) rapidly if $P > C$ ($P < C$)

Any pricing plan with $TR > TC$ is eliminated by competition

Theory of Monopoly

Monopoly pricing practices

Higher prices (above MC)

Constrain output

Sustainable price with possible price discrimination

Monopoly power (economies of scale) that can
prevent entry

Identify the price elasticity of each consumers
group

Prevent resales

Theory of Monopoly

De jure (in law) vs. de facto (the fact) monopoly

De jure monopoly: local phone service

De facto monopoly (physical, natural monopoly):
electricity, water supply

Inefficiency of monopoly

Summary

Supply and Demand

Based on cost: FC vs. VC, TC vs. AC, TC vs. MC

Economic efficiency in telephony

Prices based on costs: MC pricing, Ramsey pricing

Define service correctly

No cross-subsidies

Competition

Theory of monopoly

Economies of scale