# Topic 2

## Economics and Valuation. The market and the allocation of forest resources.

The market and the allocation of forest resources. Market imperfections and externalities: the case of forest resources. First approach to the valuation of forest goods and services: the product, the tree, the stand and the forest. Time and interest. The arithmetic of interest and practical assessment of forest land. Compensation and damage assessment

1

## Market and forest resources allocation.

Economics deals with how an economy meets certain desires of people. In this framework, a desire is expressed as **Demand.**

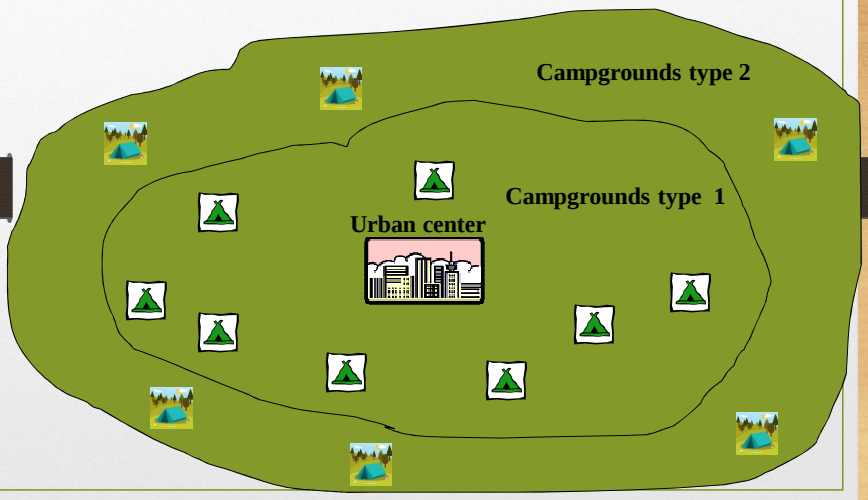
Consumers demand drive the practice of forestry:

- Demands for recreation
- Endangered plant on animal species
- Wood products
- Scenic beauty
- Biological diversity
- Soil and water protection
- Oxigen...

**Demand** of a good (or service) shows the quantities of that good consumed at different prices by a given group over some period in time.

2

## Market and forest resources allocation.




## Market and forest resources allocation.

**What determines the price of a type 1 campground?**

**What determines the number of type 1 campgrounds?**

**What determines who has access to the recreation area closer to the urban center and who must move farther out?**

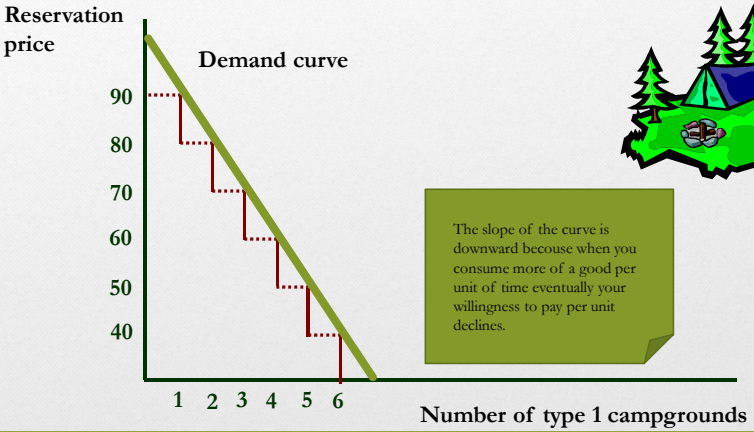
**How to analyze different ways of allocating campgrounds to individuals?**

4

## Market and forest resources allocation.

**Demand curves from the consumers point of view**

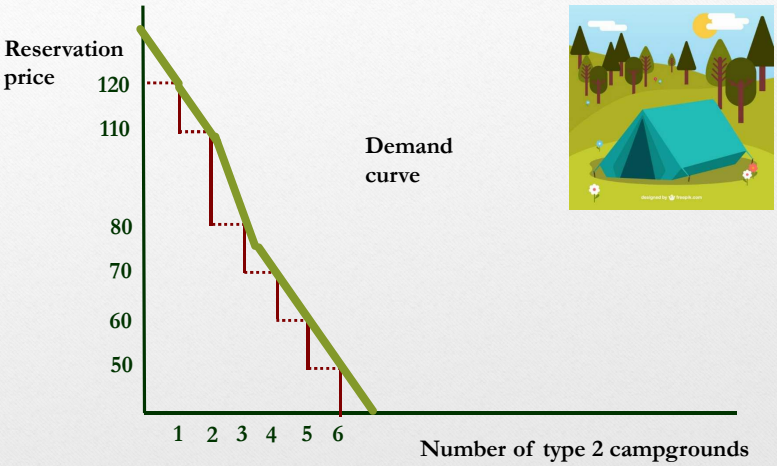
***- If the price of a good or service is P, what quantity will the consumer(s)buy?***






5

## Market and forest resources allocation.

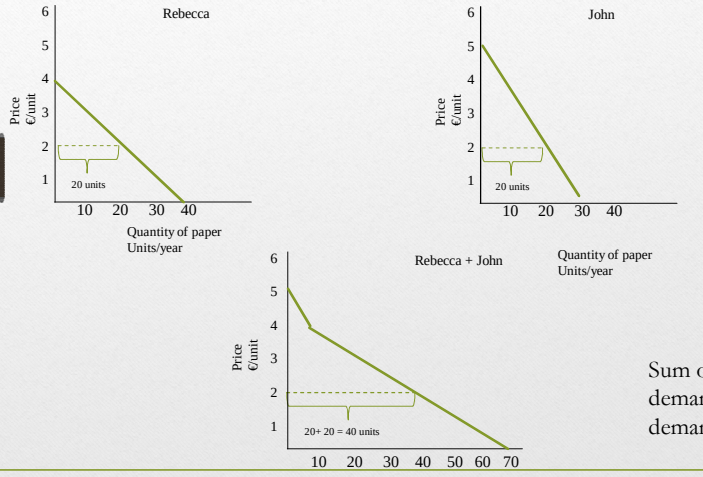





6

## Market and forest resources allocation.

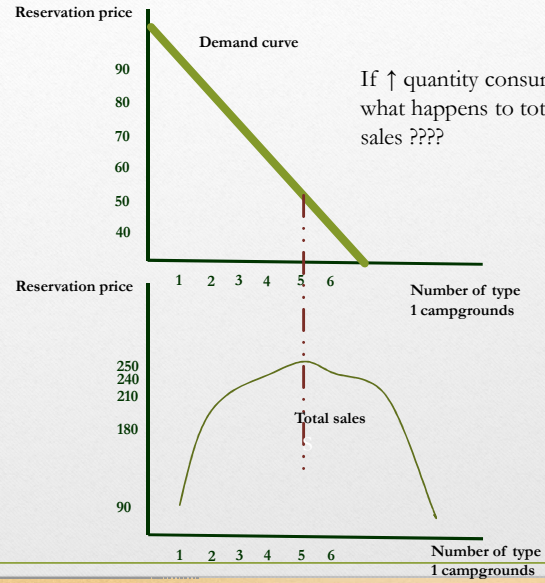
**Demand for paper**




Sum of individual demands = market demand curve

7

## Market and forest resources allocation.




If ↑ quantity consumed what happens to total sales ????

The relation between demand and total sales is measured by the **price elasticity of demand.**

8

## Market and forest resources allocation.

**Price elasticity of demand (PED)**

$$PED = \frac{\%\ change\ in\ quantity\ demanded}{\%\ change\ in\ price}$$

The percent change is the quantity of good demanded divided by the percent change in its price.
Elasticity is the percent change in quantity of a good demanded with a one percent change in price.

| | | |
|---|---|---|
| When \|PED\| is: | > 1 | Demand curve is elastic |
| | = 1 | Demand unitary |
| | < 1 | Inelastic demand |

Also…

| | | |
|---|---|---|
| When \|PED\| is: | = 0 | Perfectly inelastic \| |
| | = ∞ | Perfect elastic ---- |

9

## Market and forest resources allocation.

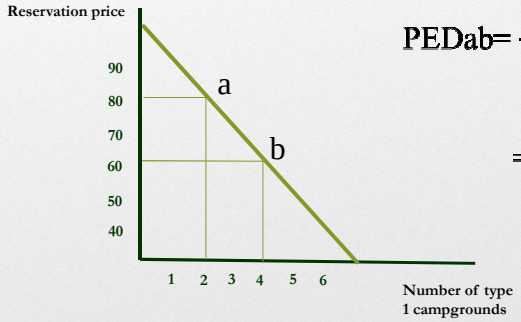
$$PED = \frac{\%\ change\ in\ quantity\ demanded}{\%\ change\ in\ price}$$

$$PED = \frac{\Delta Q/Q}{\Delta P/P} = \frac{\Delta Q}{Q} \times \frac{P}{\Delta P} = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

10

## Market and forest resources allocation.

$$PED = \frac{\%\ change\ in\ quantity\ demanded}{\%\ change\ in\ price}$$




$$PEDab = \frac{Qb - Qa / Qa}{Pb - Pa / Pa} = \frac{4 - 2 / 2}{60 - 80 / 80}$$

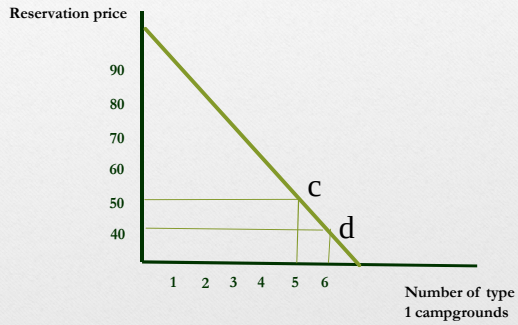
$$= \frac{2/2}{-20/80} = \frac{1}{-1/4}$$

$$= 1 \times \frac{4}{1} = 4$$

11

## Market and forest resources allocation.

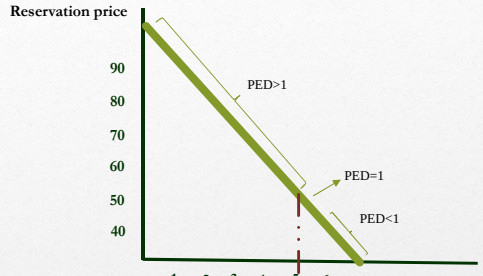
$$PED = \frac{\%\ change\ in\ quantity\ demanded}{\%\ change\ in\ price}$$

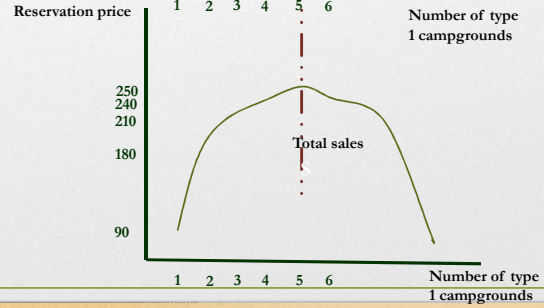



PEDcd= 1

12

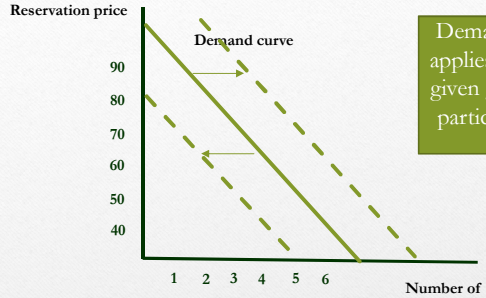
## Market and forest resources allocation.




13

## Market and forest resources allocation.

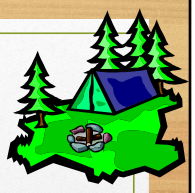



Demand curve applies only to a given group at a particular time

Demand shifter

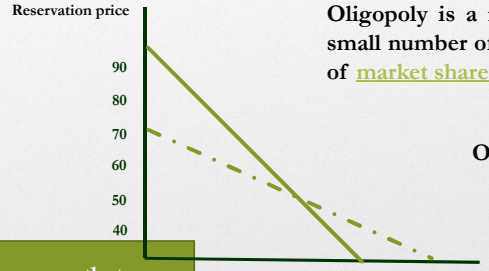
14

## Market and forest resources allocation.



**Demand curves from the producer's point of view**

***- If a firm produces quantity Q of a good what will the price be?***




When more that one competitor in the market we are facing perfect competition

Oligopoly is a market structure in which a small number of firms has the large majority of market share.

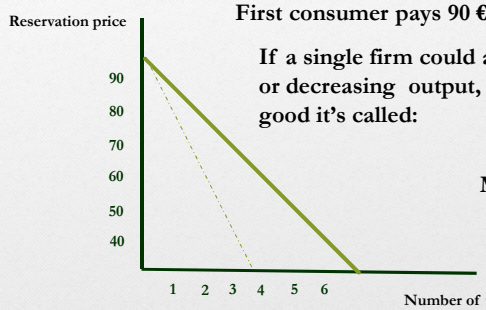
**OLIGOPOLIST**

Price takers

## Market and forest resources allocation.

**Demand curves from the producer's point of view**

***- If a firm produces quantity Q of a good what will the price be?***




**First consumer pays 90 € / campground ...**

If a single firm could affect the price by increasing or decreasing output, or has all the production of a good it's called:

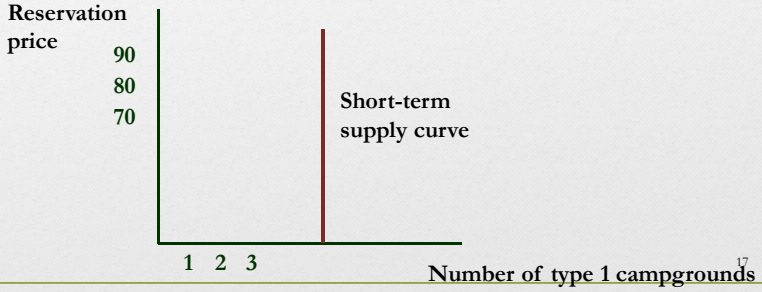
**MONOPOLIST**

Market power

16

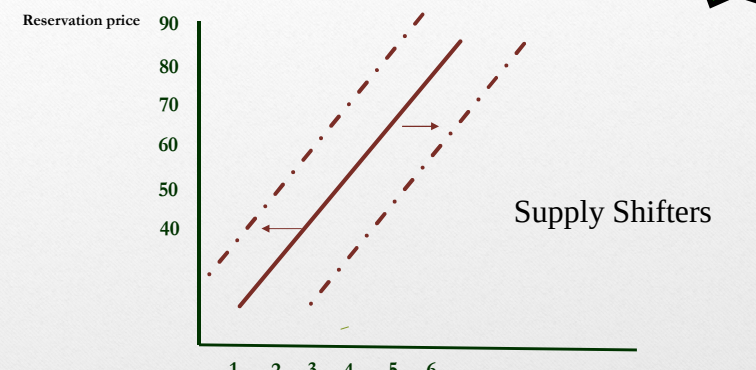
## Market and forest resources allocation..

- In economics, **supply** refers to the quantities of a good or service that a producer or group of producers will supply per unit of time at different prices. A supply curve (function) shows this relationship graphically (mathematically) with price on the y axis and quantity on the x axis.




17

## Market and forest resources allocation.




18

## Market and forest resources allocation.

Without any competition in a market, only one firm buys all the goods /services and may influence the price. Its called **monopsonist.**

When the opposite situation happens (market competition/small or large group buys the supplied goods they are called **oligopsony.**

19

## Market and forest resources allocation.

**Price elasticity of Supply (PES)**

$$PES = \frac{\%\ \Delta\ Q\ supplied}{\%\ \Delta\ P}$$

The percent change is the quantity of good supplied divided by the percent change in its price for a given range of output. Elasticity is the percent change in quantity of a good supplied with a one percent change in price.

When PES is: > 1 Supply curve is elastic
= 1 Supply unitary
< 1 Inelastic supply

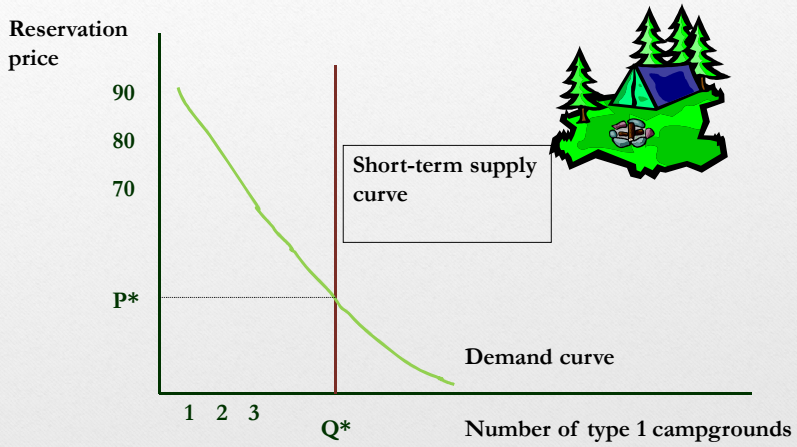
Also…

When PES is: = 0 Perfectly inelastic |
= ∞ Perfect elastic ---

20

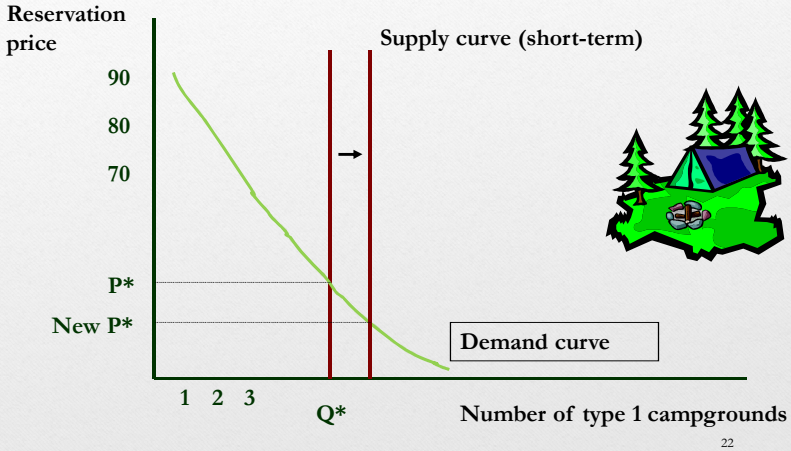
## Market and forest resources allocation.

Supply-Demand equilibrium

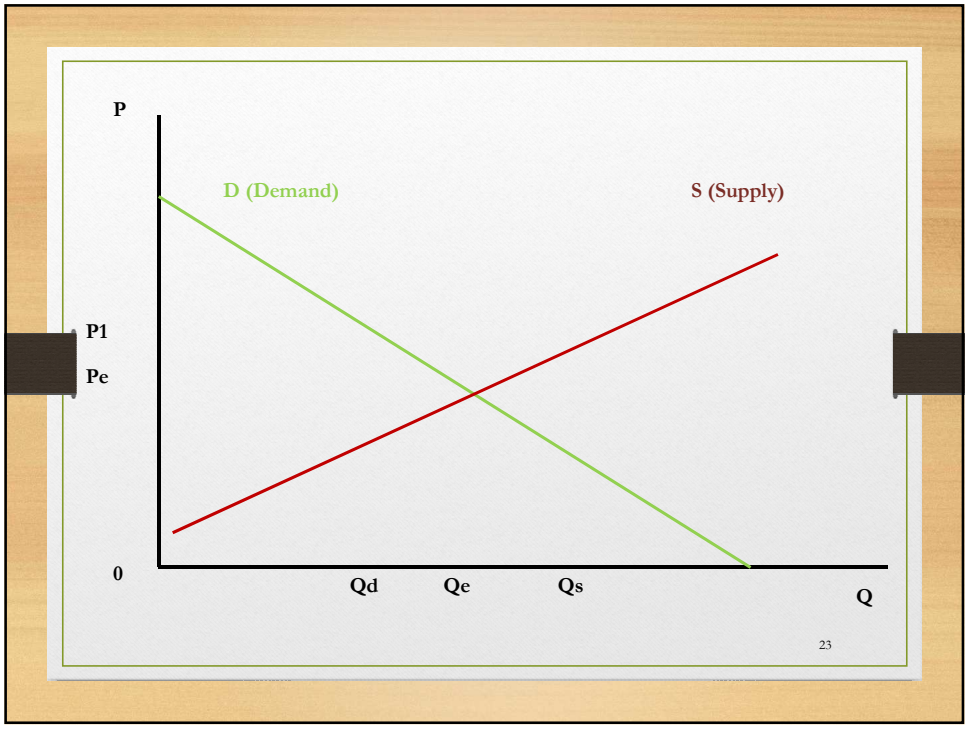


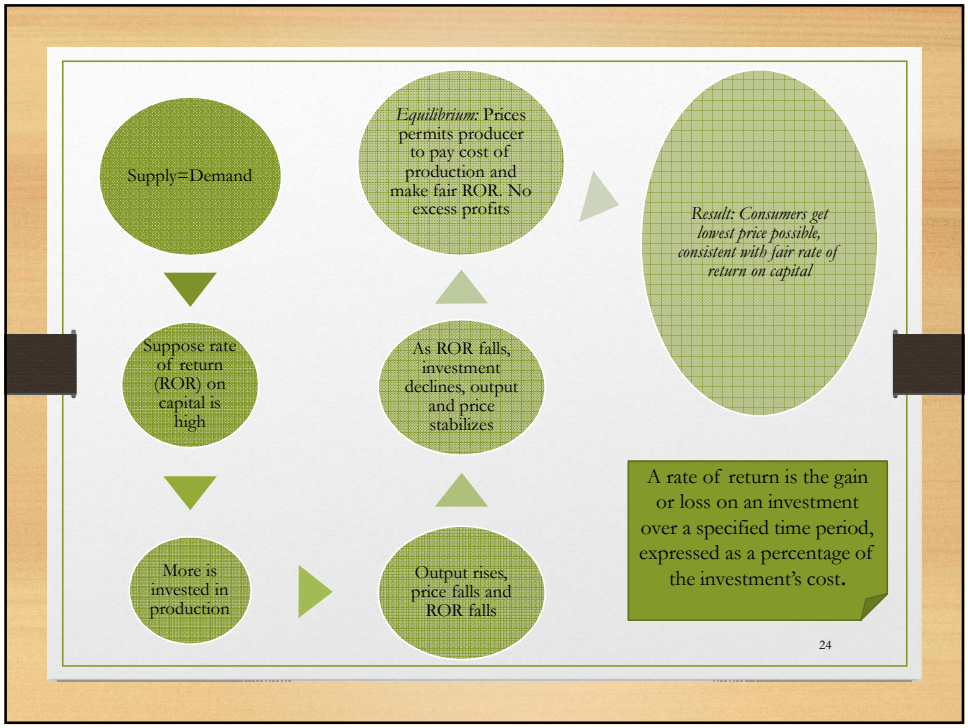

21

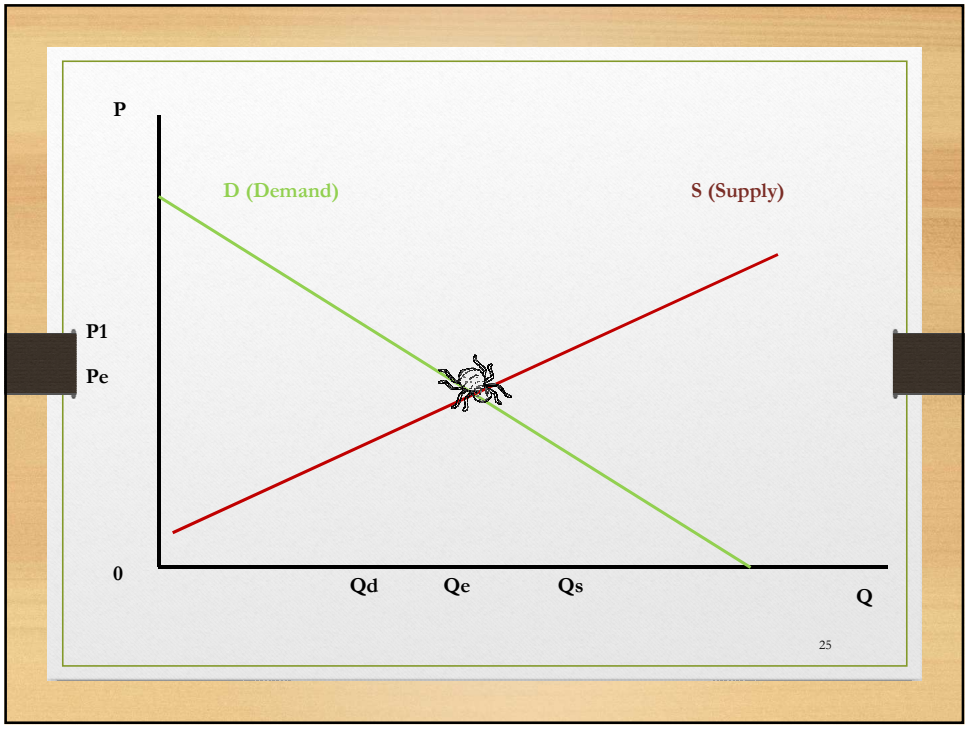
## Market and forest resources allocation.

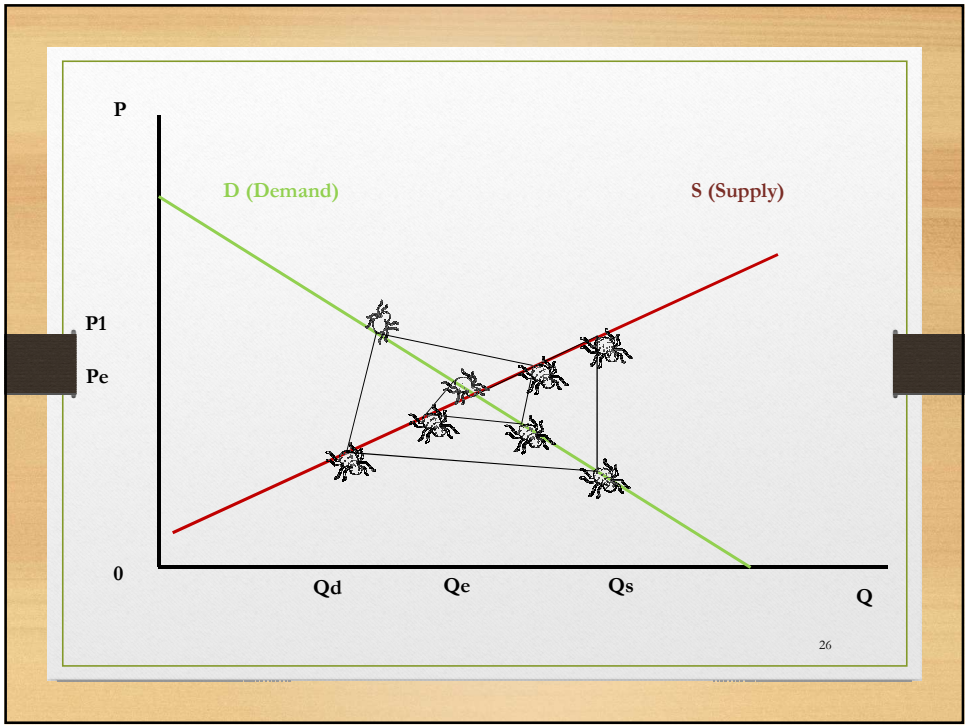


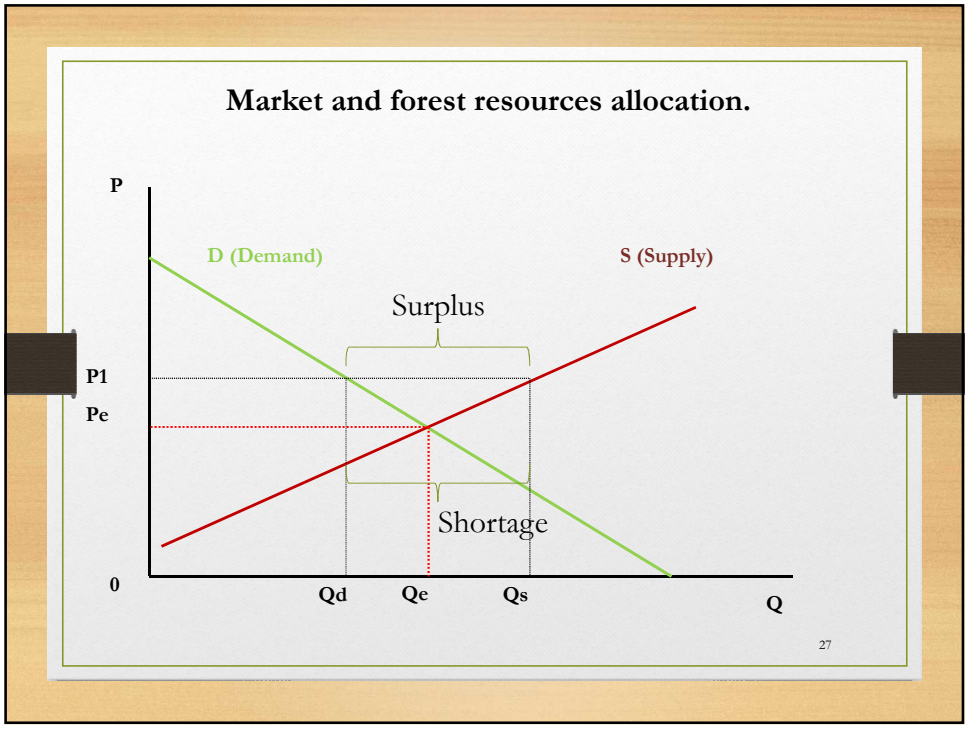

22

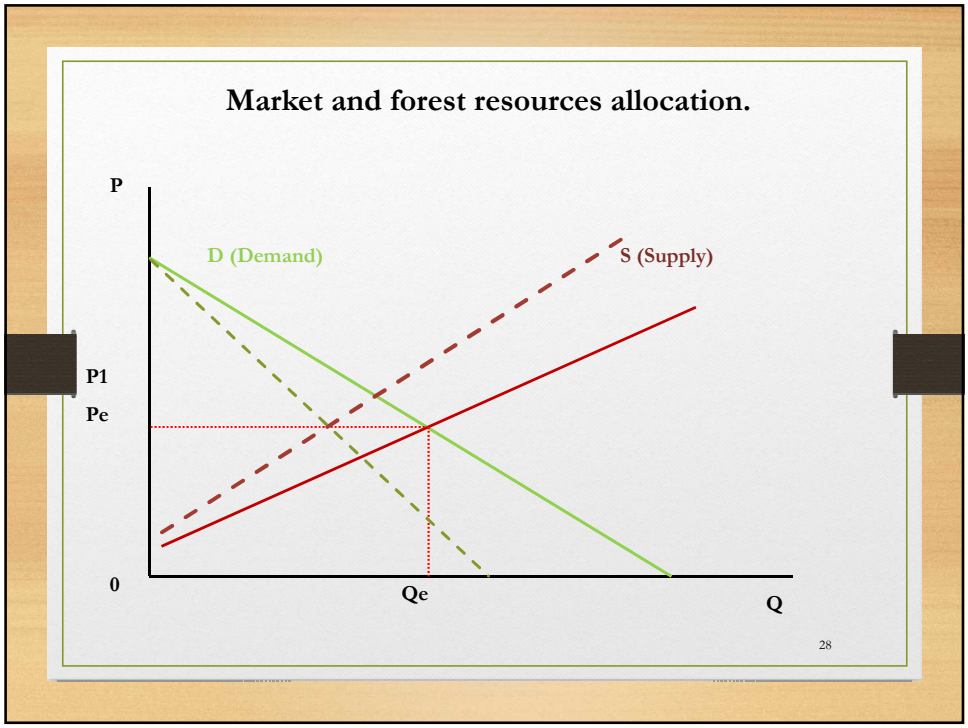

P
D (Demand)
S (Supply)
P1
Pe
0
Qd
Qe
Qs
Q
23


Supply=Demand
Suppose rate of return (ROR) on capital is high
More is invested in production
Output rises, price falls and ROR falls
As ROR falls, investment declines, output and price stabilizes
*Equilibrium:* Prices permits producer to pay cost of production and make fair ROR. No excess profits
*Result: Consumers get lowest price possible, consistent with fair rate of return on capital*
A rate of return is the gain or loss on an investment over a specified time period, expressed as a percentage of the investment's cost.
24


P
D (Demand)
S (Supply)
P1
Pe
0
Qd
Qe
Qs
Q
25

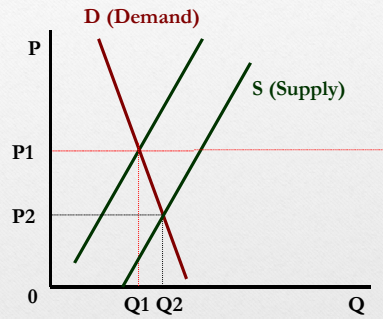

P
D (Demand)
S (Supply)
P1
Pe
0
Qd
Qe
Qs
Q
26


Market and forest resources allocation.
P
D (Demand)
S (Supply)
Surplus
P1
Pe
Shortage
0
Qd
Qe
Qs
Q
27

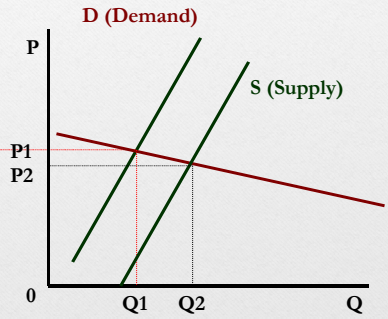

Market and forest resources allocation.
P
D (Demand)
S (Supply)
P1
Pe
0
Qe
Q
28

## Market and forest resources allocation.

Inelastic demand




Elastic demand

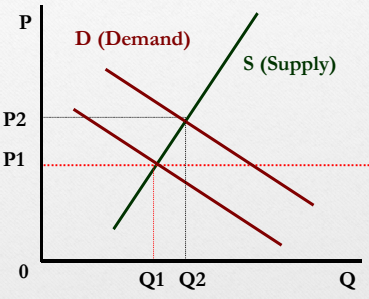



29

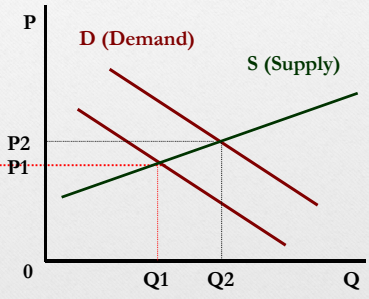
From Klemperer 1996

## Market and forest resources allocation.

Inelastic supply




Elastic supply




30

From Klemperer 1996

## Resource allocation in a competitive market: the case of forest resources.

- Conditions to have maximize the social well-being:
  - **Property rights to resources are enforced** : Ownership of all land and resources such as timber is clearly defined so free access to any scarce resource isn't allowed
  - **Firms and consumers are maximizers:** Firms attempt to maximize net revenues and consumers wish to maximize utility.
  - **Perfect competition**: Under perfect competition, firms are price takers-, each is so small that it faces a horizontal demand curve for its product and cannot affect the market price. Prices-increases by one firm will cause buyers to shop elsewhere. Consumers and firms face horizontal supply curves for inputs and cant affect their prices.
  - **Free entry of firms:** If higher than normal rates of return can be earned in one industry, new firms can enter to increase output, leading to lower prices.
  - **Perfect information:** Consumers know about available outputs and their prices and firms have information about production technologies, inputs and prices of all inputs and outputs over time.

31

## Resource allocation in a competitive market: the case of forest resources.

- Conditions to have maximize the social well-being:
  - **Mobility of labor and capital:** Labor is available at the competitive wage, and capital comes forth at competitive interest rates
  - **No unprices negative effects:** In production processes, there are no costs imposed on others for which the producer needn't pay.
  - **Priced inputs and outputs:** All products, services and resources can be sold at a price, so there's an incentive for the market to provide them
  - **Satisfactory income distribution:** the distribution of income among citizen, current and future must be satisfactory.

**When these conditions are not met, we have MARKET FAILURES**

32

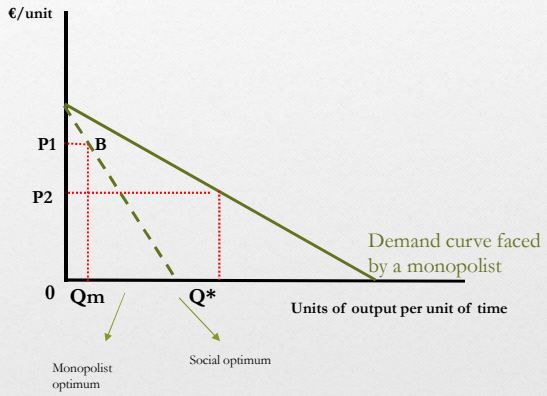
## Resource allocation in a competitive market: the case of forest resources.

- Results when welfare is maximized:
  - **Consumers' needs are met** : Consumers vote with money to receive desired outputs. Prices will be as low as possible, consistent with acceptable rates of return to capital
  - **Consumers maximize their satisfaction by applying the equi-marginal principle:** A rational consumer allocates funds so that the last € spent per unit of time on every good or service brings the same satisfaction.
  - **Capital will be allocated efficiently**: Inventor will place funds where they will earn the best returns. At any given risk level, interest rates of return on added investment will move toward an equilibrium.
  - **Labor and other resources are allocated efficiently**: Employees move to jobs where the pay is best. Other resources, like timer are used in enterprises that can afford to pay the most for them…
  - **Producers seek efficient levels of output**: This occurs where the added revenue per unit of output equals to added cost.
  - **Land is allocated efficiently:** Land will go the highest bidder who uses it for the most profitable enterprise.
  - **No redistribution of income could yield any net benefit:** The losses from redistribution income would exceed the benefits.

33

## Market failures and externalities: the case of forest resources.

### Monopoly – imperfect competition




34

## Key points

- The demand curve for a good shows the quantities of the good that will be bought at different prices. (willingness to pay)
- A demand curve applies to a specific group of one or more people holding shifters constants.
- Price elasticity of demand is the percent change in quantity demanded with 1% change in price. Elasticity has a product impact on the way sales revenue from a good changes as output is increased.
- A market demand curve, from the consumers view will slope downwards
- For any enterprise it is important to express returns to capital as a percentage of capital value – rate of return
- A monopolist is a single firm producing all output of one product and service in a market. The firm has market power, since it changes the demand curve.

35

## Key points

- The supply curve shows much a good would tend to be supplied at different prices.
- The supply curve is the horizontal sum of individual firms supply curves. Holding shifters it shows the amount of a good produced at different price.
- Price elasticity of supply is the in que quantity of good supplied with 1 percent change in its price
- A monopsonist happens when an input is bought by only one firm.
- Equilibrium price and quantity in a market for a good is at the intersection of the supply and demand curves. The elasticities of demand and supply can sharply affect the price and quantity changes when either demand or supply curves shift.

36

## Key points

- Under competitive conditions, when excess profits exists for firms producing a good, more is invested in production: the supply curves shifts to the right , and price falls until normal returns to capital are earned.
- Long run supply/demand is a dynamic construct and shows intersection points of short run demand and supply curves over time as demand shifts rightward (or leftwards).
- Both long run demand and supply tend to be more elastic than a short run demand and supply. Thus, a shift in supply or demand curves in the short run cause relatively large price changes and small quantity changes. But is long run causes smaller price changers and large quantity changes
- Due to imperfect information, rather than maximize profits, firms are more often seeking satisfactory profits.

37