

UNIT 2

SUPPLY, DEMAND AND MARKETS

J. Alberto Molina



Facultad de
Economía y Empresa
Universidad Zaragoza

UNIT 2. SUPPLY, DEMAND AND MARKETS

2.1 Demand (Pindyck → 2.1)

- Definition (the demand curve and market demand)
- Movements of the demand curve

2.2 Supply (Pindyck → 2.1)

- Definition (supply curve and market supply)
- Movements of the supply curve

2.3 Equilibrium in the competitive market. (Pindyck → 2.2 y 2.3)

- Market mechanism
- Equilibrium price
- Market mechanism

2.4 Elasticities of demand and supply (Pindyck → 2.4 y 2.5)

- Elasticities of demand
- Elasticities of supply
- Elasticities in the long and short term

Introduction

- **Market:** group of buyers and sellers who, through their interaction, determine the price of a good:
 - Buyers- Demand Section 1
 - Sellers – Supply Section 2
- The theory of Supply and Demand is a fundamental instrument that can be applied to a wide variety of interesting and important economic problems

In this lesson we will:

- Analyze the characteristics of supply and demand
- Understand the phenomena that take place in the market
- Obtain observed prices and quantities.

2.1 Demand (the demand curve and market demand)

- The quantity of a specific good that consumers are willing to buy depends on:
 - The price of the good (p)
 - The income of the consumer (Y)
 - The prices of other related goods (p_{OG})
 - Preferences (G)
 - Size of the market and/or number of consumers (N)
- **Demand function:** it is the mathematical relationship between the quantity demanded (endogenous) and the variables that influence such quantity (exogenous)

$$q_D = D(p, Y, p_{OG}, G, N)$$

- **Demand curve:** indicates how much of a good at a specific price are consumers willing to buy if the other factors remain constant (“ceteris paribus”).

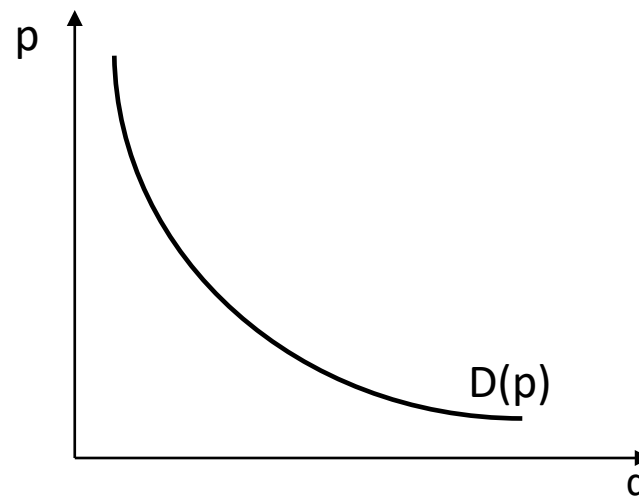
$$q_D = D(p)$$

2.1 Demand

- **The law of demand:** as the price of a good increases, the quantity demanded decreases (Inverse relationship between the price and the quantity)

By the law of demand, the demand curve is decreasing (negative slope):

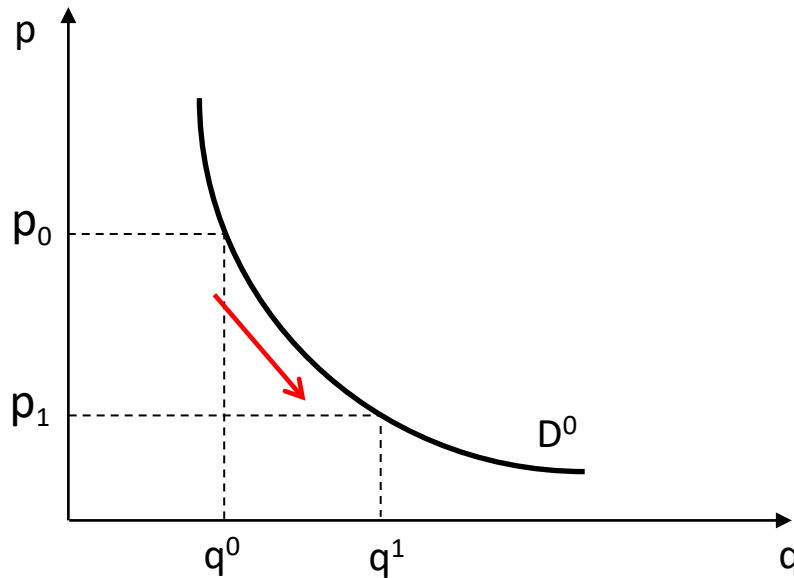
- As the price of a good increases, some consumers will stop consuming or will decrease the quantity and, in its place, look for other less expensive goods (***Substitution effect***)
- As the price of a good increases, buying power is reduced and consumers react by reducing their consumption of all goods (***Income effect***)



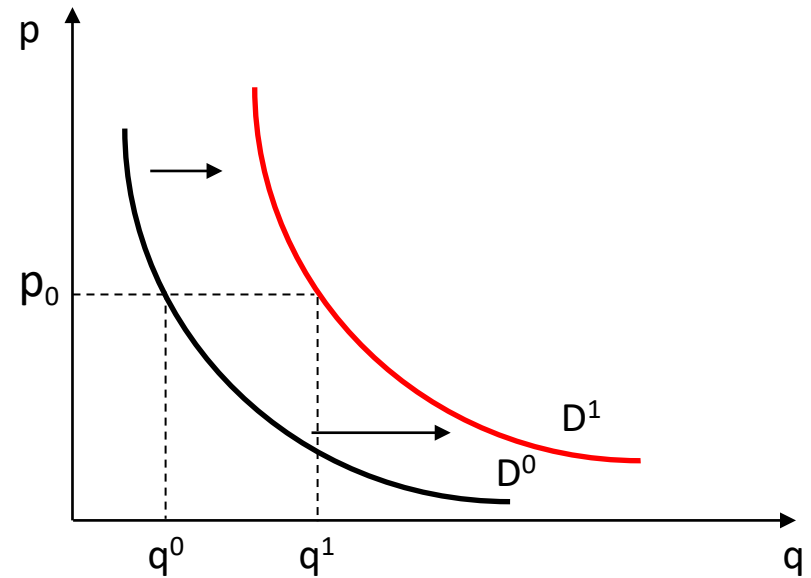
2.1 Demand

Changes in demand and the quantity demanded:

- If P varies, the demand curve does not change: Movement along the curve \rightarrow the quantity demanded changes: Graph A
- If other exogenous variables change, the demand curve moves and, consequently, the quantity demanded changes: Graph B



Graph A



Graph B

2.1 Demand

MOVEMENTS OF DEMAND CURVE (P constant):

- **Variation in income (Y):**
 - Normal goods: the quantity demanded increases as income increases (movement of the curve to the right)
 - Inferior goods: the quantity demanded decreases as income increases (movement of the curve to the left)
 - Neutral goods: the quantity demanded does not depend on income (no movement)
- **Variation in the price of related goods (p_{OD}):**
 - Complementary goods: satisfy a need in a simultaneous way (quantities move in the same direction)
 - Substitute goods: satisfy a need in an alternative way (quantities move in opposite directions)
 - Independent goods: their demand is independent
- **Consumer preferences (G):** increasing: movement of the curve to the right
- **Number of consumers (N):** increasing: movement of the curve to the right

2.2 Supply (the supply curve and market supply)

- The quantity of a good that producers are willing to sell depends on:
 - The selling price of the good (p)
 - Production costs (C)
 - The prices of production factors (p_F)
 - Technology (T)
 - Size of the market or number of producers (N)
- **Supply function:** It is the mathematical relationship between the quantity offered (endogenous) and the variables that influence such quantity (exogenous):

$$q_s = S(p, C, p_F, T, N)$$

- **Supply curve:** indicates how much of a good at a specific price producers are willing to sell, other factors remaining constant (“ceteris paribus”)

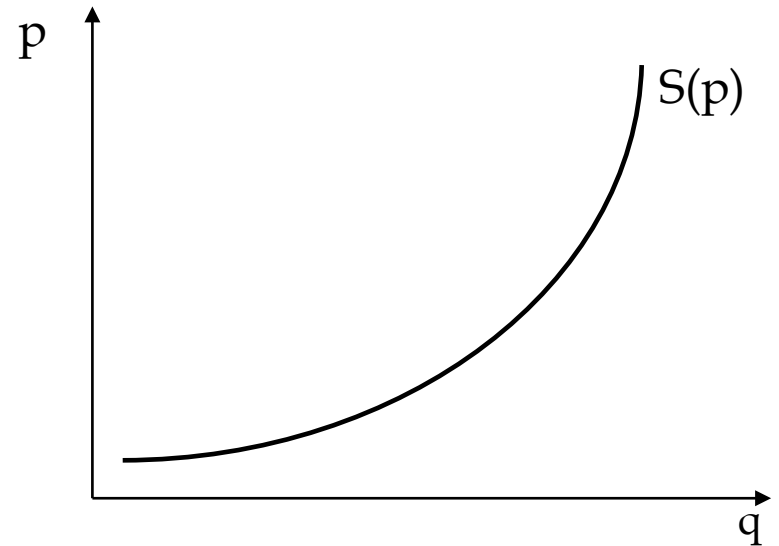
$$q_s = S(p)$$

2.2 Supply

- **Law of supply:** The higher the price, the greater the quantity that producers are willing to sell. There is a direct relationship between the price of the good and the quantity.

By the law of supply, the supply curve is increasing (positive slope):

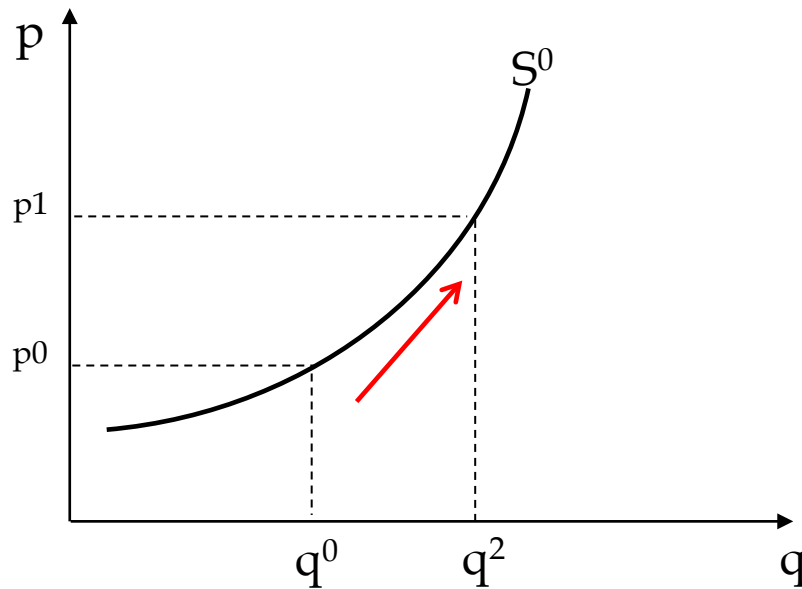
- An increase in the price of a good encourages an increase in production (more productive factors, more producers in the market)



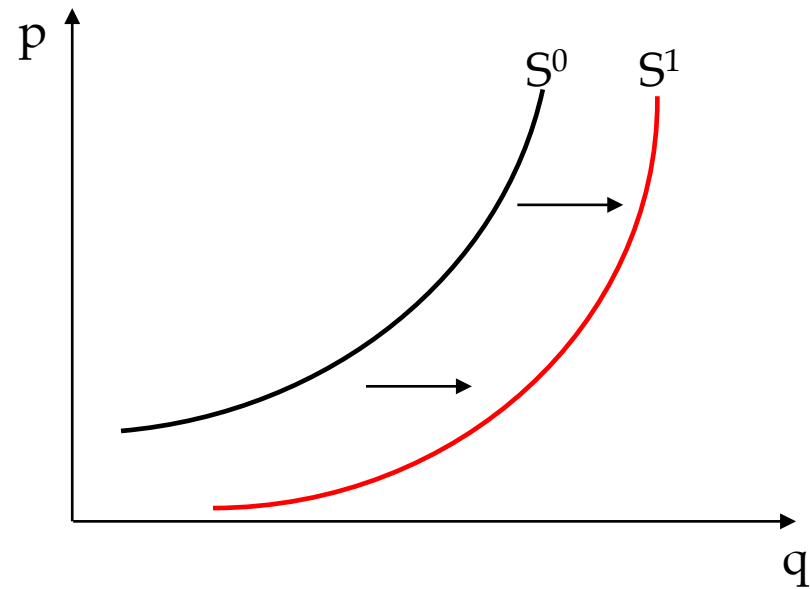
2.2 Supply

Changes in the quantity offered and in the supply curve (P constant):

- If P varies the supply curve does not change: Movement along the curve → the quantity offered changes: Graph A
- If other exogenous variables change (r , P_F , t or N), the supply curve moves and, consequently, the quantity offered changes: Graph B



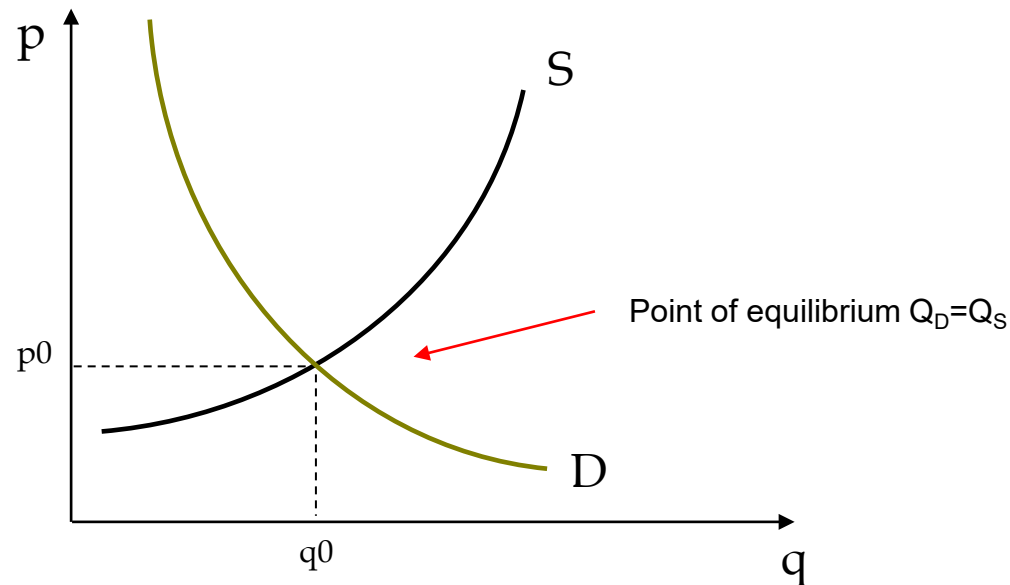
Graph A



Graph B

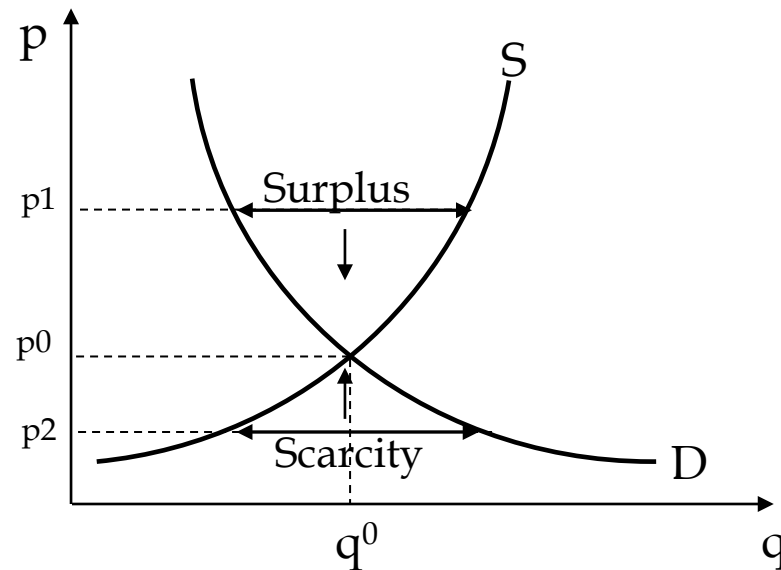
2.3 Equilibrium in the competitive market

- All agents (consumers and producers) are in equilibrium: they are at the optimum point given their restrictions.
- Equilibrium occurs at the point where the two curves intersect: supply and demand ($q_D=q_S$)
- The price at this point is called Equilibrium Price



2.3 Equilibrium

- Due to the market mechanism, the price in a competitive market tends to vary until it reaches the equilibrium price (the market “empties”: demand equals supply).
- If the market price is greater than the equilibrium price ($p^1 > p^0$), the supply is greater than the demand and there is a **surplus** in the market (not all that is produced is sold) → Pressure to lower the price
- If the market price is less than the equilibrium price ($p^2 < p^0$), consumers would want to buy more than there is and there is a **scarcity** in the market → Pressure to increase the price

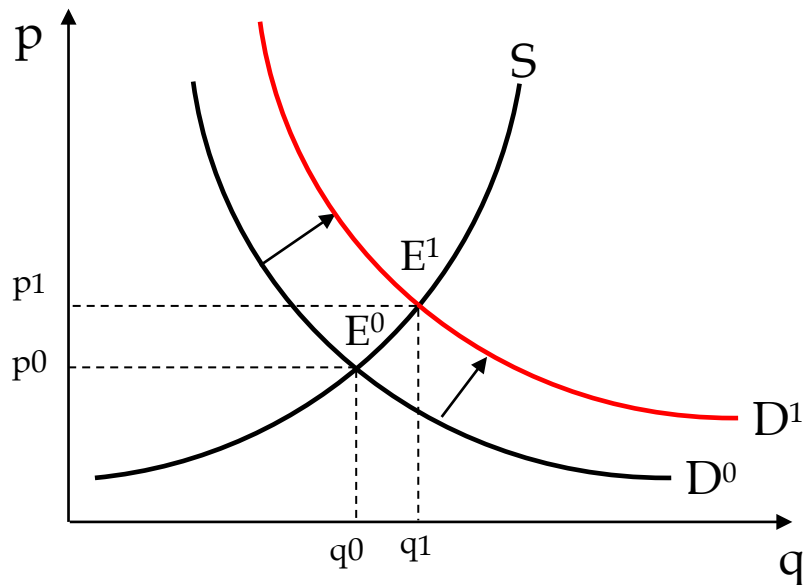


2.3 Equilibrium

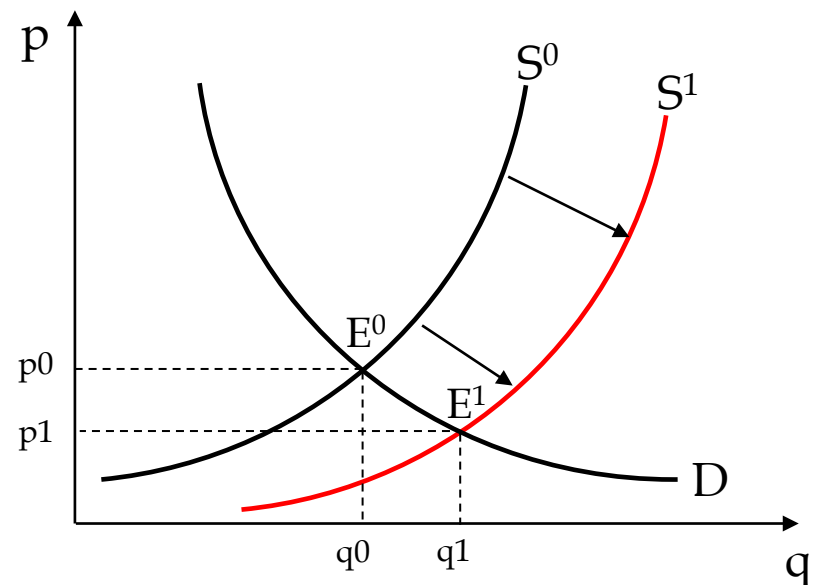
Variations:

- If the demand curve moves: the price and the quantity vary in the same direction.
- If the supply curve moves: the price and the quantity vary in opposite directions

a) Movement of demand



b) Movement of supply

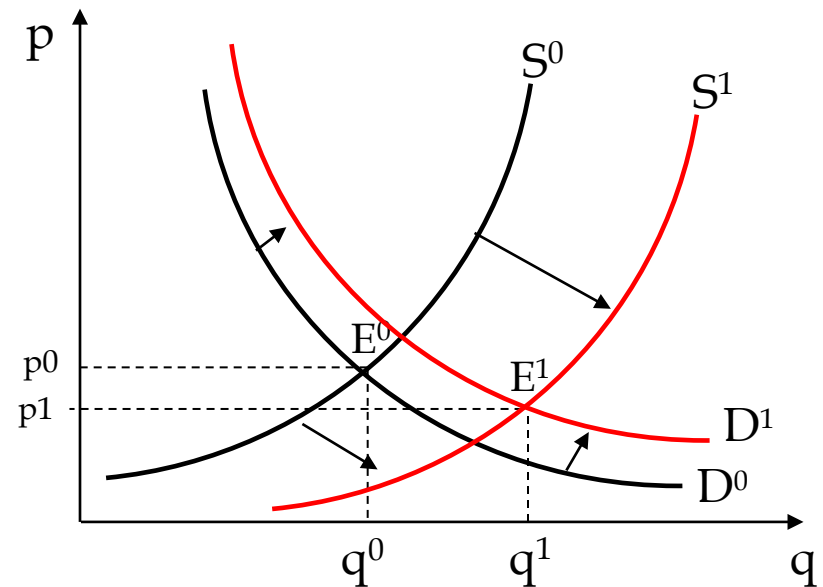
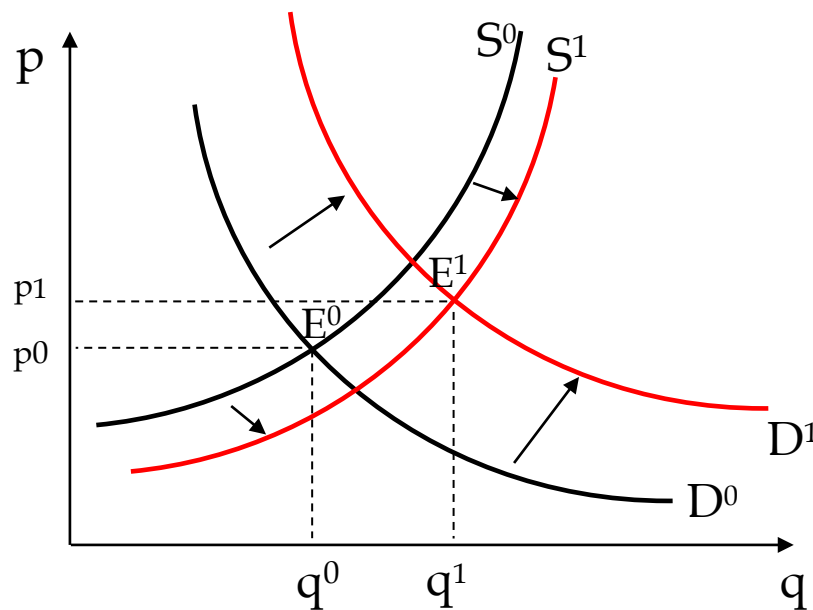


2.3 Equilibrium

Variations:

- If the two curves move simultaneously, the variation of one of the two variables is determined (P or Q) and the movement of the other depends on the intensity of the movement.

c) Movement of supply and demand (both to the right)



2.3 Equilibrium

Summary of variations:

Movement	Effect on price	Effect on quantity
D to the right	Up	Up
D to the left	Down	Down
S to the right	Down	Up
S to the left	Up	Down
D to the right & S to the right	??	Up
D to the right & S to the left	Up	??
D to the left & S to the right	Down	??
D to the left & S to the left	??	Down

2.4 Elasticities of demand and supply

Elasticity of demand (demand price):

- The **elasticity** measures the sensitivity of a variable with respect to another. It indicates the % of variation that one variable experiences due to a % variation in another one.
- The % of variation is the total variation ($\Delta = \text{final value} - \text{initial value}$) divided by the initial value.
- **Elasticity of the demand price:** % of variation that the demanded quantity experiences due to a % of variation in the price

$$e_D = \frac{\text{Percentage of variation in the demanded quantity}}{\text{Percentage of variation in the price}} = - \frac{\frac{\Delta q}{q}}{\frac{\Delta p}{p}} = - \frac{p}{q} \frac{\Delta q}{\Delta p}$$

- The elasticity price is defined by convention with a negative sign. This is so to work with positive values, thus facilitating interpretation, given that price and quantity usually vary in opposite directions.

2.4 Elasticities

Elasticity of the demand price:

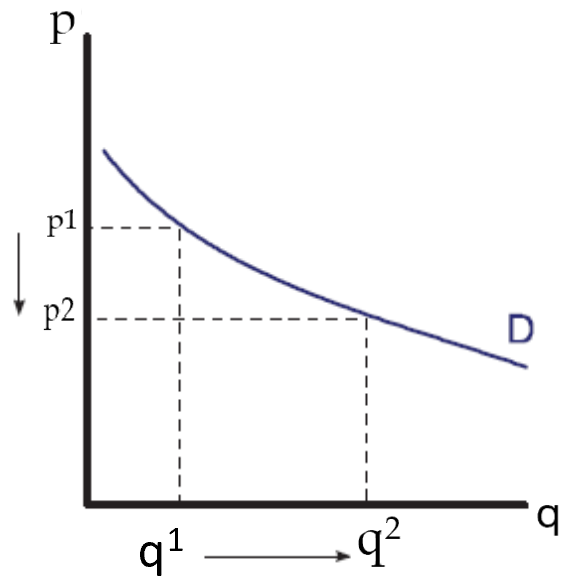
- Interpretation of the elasticity-price:
 - If $e_D > 1$: the demand is elastic relative to the price (the percentage decrease of the demanded quantity is greater than the percentage increase of the price)
 - If $e_D < 1$: the demand is inelastic relative to the price (the percentage decrease of demanded quantity is less than the percentage increase of the price)
- Influential factors:
 - Necessities (food...): more inelastic demand
 - If there are substitute goods: more elastic demand.
 - The greater the proportion of income spent: more inelastic demand
 - Addictive goods: more inelastic demand.
 - Period of time: demand is, in general, more elastic in the long term.

2.4 Elasticities

Elasticity demand price:

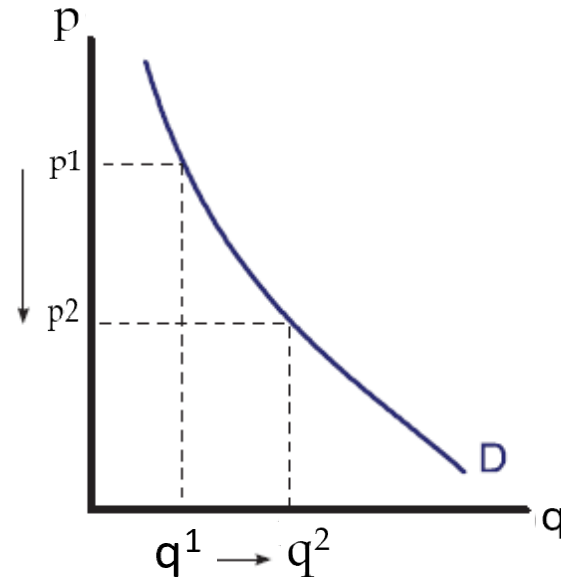
Demanda elástica

$$(e_D > 1)$$



Demanda inelástica

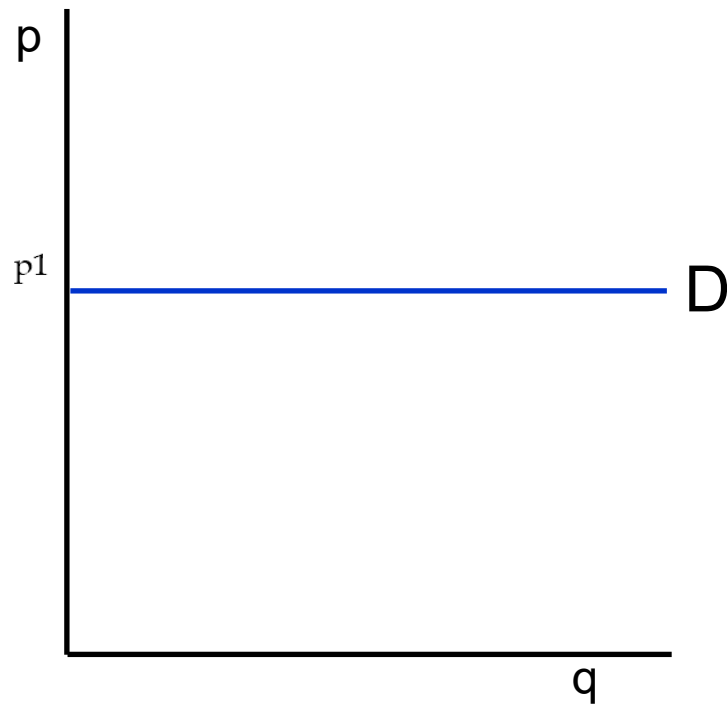
$$(e_D < 1)$$



2.4 Elasticities

- Special case:

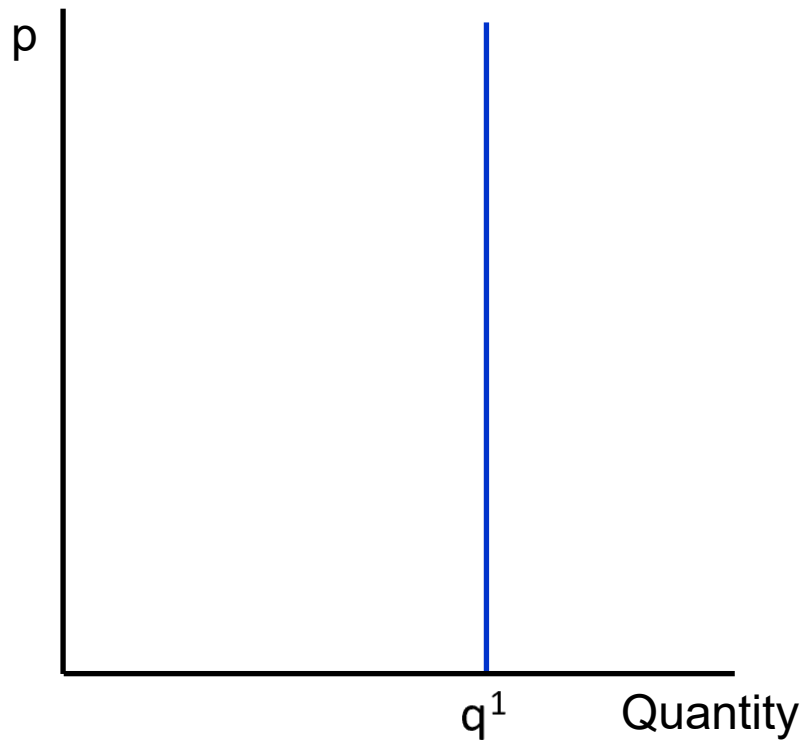
Demand infinitely elastic



2.4 Elasticities

- Special case:

Totally inelastic demand



2.4 Elasticities

Elasticity of supply (supply price)

- **Elasticity supply price:** % variation that the supply quantity experiences due to a % variation in the price.

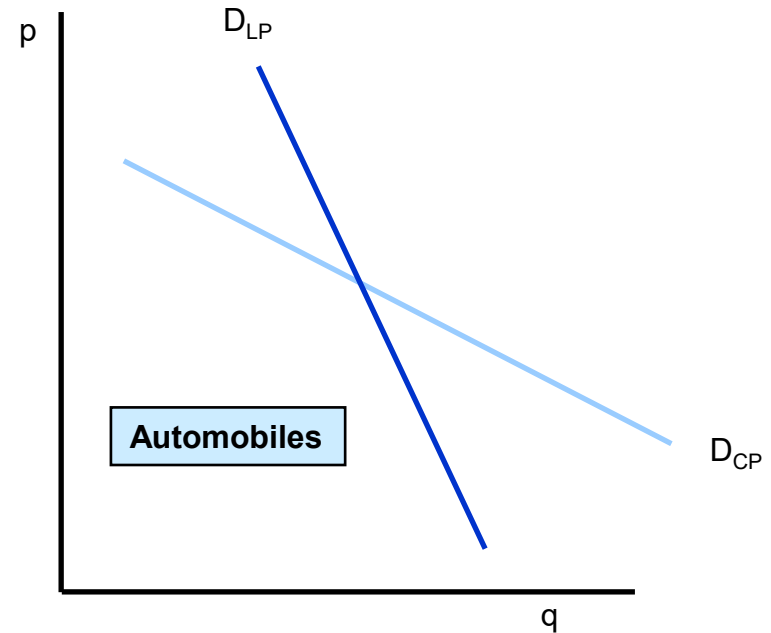
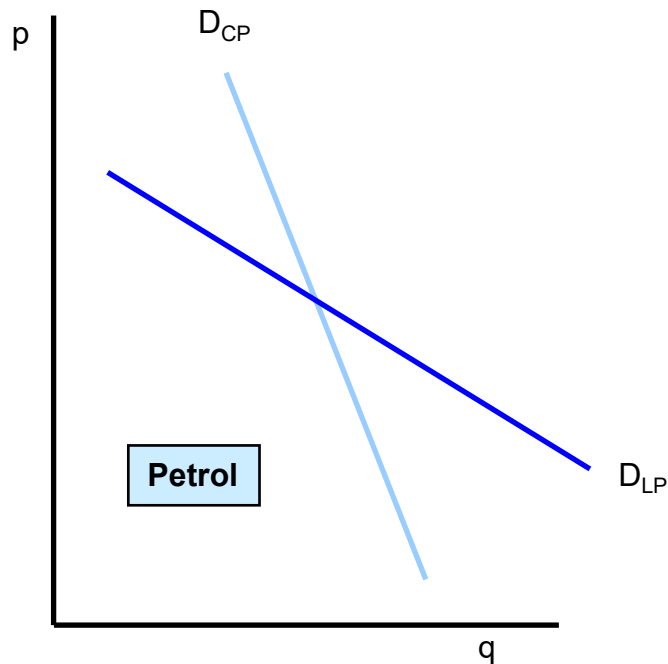
$$e_s = \frac{\text{Percentage of variation in the supply quantity}}{\text{Percentage of variation in the price}} = \frac{\frac{\Delta q}{q}}{\frac{\Delta p}{p}} = \frac{p}{q} \frac{\Delta q}{\Delta p}$$

- The elasticity of the supply price is defined with positive sign since the price and the supplied quantity usually moves in the same direction
 - If $e_s > 1$: the supply is elastic relative to the price
 - If $e_s < 1$: the supply is inelastic relative to the price

2.4 Elasticities

In the short and long term: demand:

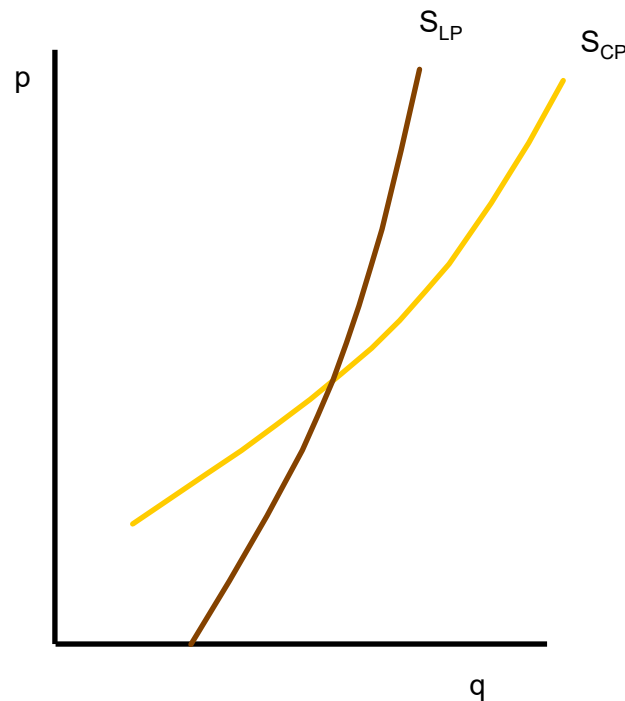
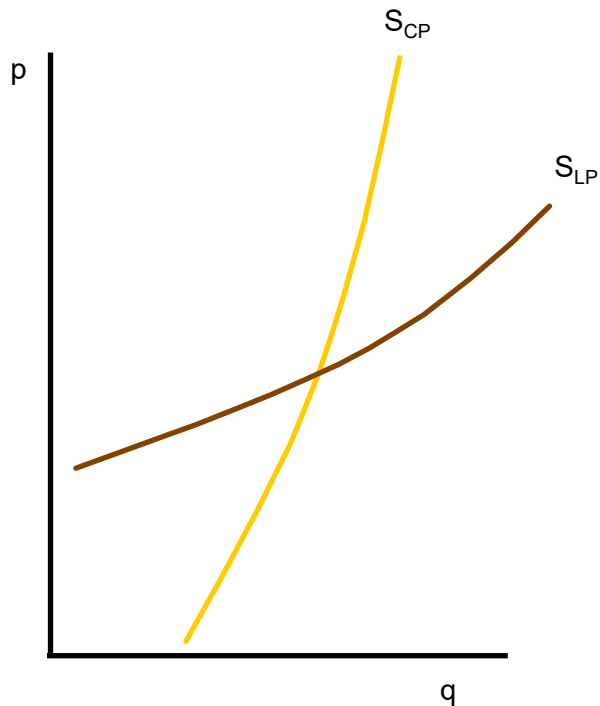
- In the majority of goods and services: elasticity in the short term is lower than in the long term (for example: petrol).
- In some specific goods (durables): elasticity in the short term is higher than in the long term (for example: automobiles).



2.4 Elasticities

In the short and long term: supply:

- The majority of goods and services: the elasticity in the short term is less than in the long term.
- In some specific goods (durables, recyclables): the elasticity in the long term is less than the elasticity in the short term.



Exercises

- 1.- Which of the following variables, by a movement along the curve, change the quantity demanded?
 - a) The technology of production of the good
 - b) The price of other goods
 - c) The income
 - d) The price of the good
- 2.- A movement toward the right of the demand curve of a good is produced when:
 - a) There is a decrease in the price of a substitute good
 - b) There is a decrease in the income of consumers
 - c) There is an increase in the price of a complementary good
 - d) The good becomes more fashionable
- 3.- A movement toward the right of the supply curve of a product indicates that:
 - a) The number of companies is reduced
 - b) For each product price, a lesser quantity will be offered
 - c) An increase in the price of one of the inputs occurred
 - d) A technological innovation has occurred

- 4.- If the supply and demand of a good go to the left simultaneously, then:
- a) The equilibrium quantity and the equilibrium price increase
 - b) The equilibrium quantity and the equilibrium price decrease
 - c) The equilibrium price decreases, but the effect on the equilibrium quantity is uncertain
 - d) The equilibrium quantity decreases, but the effect on the equilibrium price is uncertain
- 5.- In the coffee market, what would be the effect on the equilibrium quantity of the following:
- a) An increase in the price of tea
 - b) An increase in the price of sugar
 - c) An increase in the price of the production factors
 - d) A decrease in the tax per unit of coffee
- 6.- In the fishing industry, negotiations between unions and the company lead to an agreement that increases the salaries of managers. Choose how this will affect:
- a) The prices at which consumers buy fish and meat
 - b) The total income of the fishing industry
 - c) The amount of meat and fish bought by consumers

7.- What predictions could be made regarding the demand curve of the orange market as a consequence of the following:

- a) An increase in the income of consumers
- b) An intensive advertising campaign that convinces the majority of people of the importance of a daily dose of natural vitamin C
- c) A decrease in the price of a substitute fruit
- d) A decrease in the price of oranges

8.- What would happen to the supply curve of automobiles in the following cases:

- a) A drop in the price of steel
- b) The introduction of an improved technique on the assembly line
- c) An increase in the price of automobiles
- d) An increase in the salaries of the automobile workers

9.- Imagine the market of a normal good Q. If the income per capita of all consumers increases, and the companies see the labor cost increase, what will happen to the price and the equilibrium quantity?

10.- Due to improvements in the state of the roads, the bus companies observe an increase in the demand for their services. At the same time, transportation costs rise due to an increase in the price of petrol. In this situation, what can be expected?

- a) That the price of a ticket increases and the number of riders is reduced.
- b) That both the ticket price and number of riders fall.
- c) That the ticket price increases but the variation in the number of riders cannot be known
- d) That the number of riders increases with an unknown effect on prices.

11.- Which of the following statements are correct?

- a) Those goods that have close substitutes tend to have a more elastic demand
- b) The elasticity of the supply in the short term is greater than in the long term
- c) The greater the number of substitutes in production, the greater the elasticity of the supply
- d) Basic necessities tend to have an inelastic demand

12.- If the elasticity price of meat demand is 1.91 and the price of beef rises by 10 %. How will the quantity of demand vary? The demand is elastic or inelastic?

13.- Give reasons for the elasticities of two demand curves: one represents the demand of a group of articles (e.g., turrónes), the other represents the demand for a specific brand (e.g., el Almendro). Which of the two is more elastic?

14.- Imagine that the demand curve of a product is given by $q_d = 300 - 2p + 4Y$, where Y is the median income. The supply curve is $q_s = 3p - 50$.

a) Calculate the price and quantity that balances the market, supposing $Y = 25$

b) Find the price and the quantity of balance supposing that $Y = 50$

c) Show the answers on a graph.

15.- The market of good A is characterized by: $q_d = 100 + 2Y - 2p_B - 2p_A$ and $q_s = 200 + 2p_A$, where Y is the consumer income, p_A is the price of the good A and p_B is the price of the good B (related).

a) What is the price and quantity of equilibrium in this market when the level of consumer income is 200, and the price of the good B is 50

b) Suppose that the level of consumer income increases by 50 monetary units, with the other variables remaining at previous levels. What would happen in the market in the case of the previous equilibrium price? Determine analytically and graphically the new equilibrium in relation to the previous one