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Managerial Economics

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Demand, Supply, Market



Demand and Supply

- **The Three Fundamental Economic problems.**
 - What to produce?
 - How to produce?
 - For whom to produce?
- Answer the vital questions above we must know how to work **The market mechanism.**



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Demand and Supply

- **The market mechanism** is known as **free market economy**.
 - Decisions about the vital questions are determined by supply and demand (Market).
- **Planned Economy**
 - Decisions about the vital questions are determined by relevant government (**intervention**).
- **A mixed economy occurs** when resources are allocated by a combination of the market system and government.
- In reality, **all economies are mixed**.
 - e.g. North Korea and Cuba (high level of government involvement)
 - e.g. Hong Kong and the USA (high level of free market concept)



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Understanding Demand – why?

- The success of any business depends on its ability to meet the needs of its customers.
- Drucker (1954) said that 'there is only one valid definition of business purpose is to create a customer'



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Demand

- **Demand** for a good or service is defined as **quantities of a good or service that people are ready (willing and able) to buy at various prices within some given time period**, other factors besides price held constant
- **Demand curve** – relation between the price and the quantity required, while other factors held constant
- Demand and level of demand – in English always „demand”

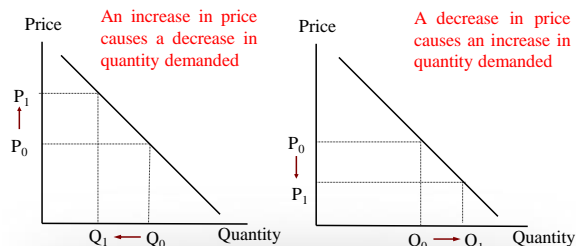


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Law of Demand

The inverse relationship between the price of the commodity and the quantity demanded per period is referred to as **the law of demand**



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Law of Demand – Good X

- Normal Goods => Income Demand for X
- Inferior Goods => Income Demand for X
- Substitutes => Price of substitutes Demand for X
- Complimentary => Price of complimentary Demand for X goods goods



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Changes in Demand

- Changes in **price** result in changes in the quantity demanded.
 - This is shown as movement **along** the demand curve.
- Changes in **nonprice determinants** result in changes in demand.
 - This is shown as a **shift** in the demand curve.



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Nonprice determinants of demand

- Buyers' Tastes
- Buyers' Incomes
 - Normal Goods (i.e. shoes, steaks, travel, automobiles, education)
 - Inferior Goods (i.e. hotdogs, hamburger)
- Number of Buyers
- Price of Related Goods
 - Substitute Goods (i.e. *Butter and margarine*)
 - Complementary Goods (i.e. cars & gasoline or electric stove & electricity)
- Future expectations



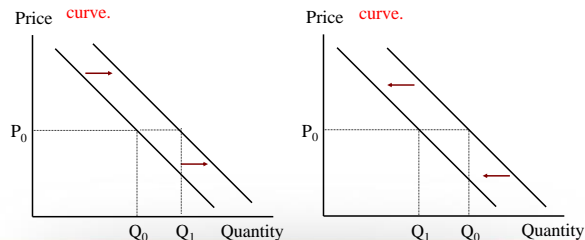
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Change in Demand

An **increase in demand** refers to a rightward shift in the market demand curve.

A **decrease in demand** refers to a leftward shift in the market demand curve.



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Function of Demand

$$Q = f(P)$$

$$Q = f(P, Ca, I, Pc)$$

P - price

Ca – number of customers

I – income of customers

Pc – price of substitutes, complimentary goods



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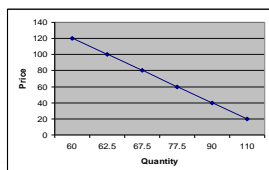
The Demand Schedule and the demand curve-Example

- How can the relationship between quantity demanded and price be portrayed?

Demand schedule

| | P (price per ton) | D (quantity demanded) Thous tons per month |
|---|-------------------|--|
| U | \$ 20 | 110 |
| V | 40 | 90 |
| W | 60 | 77.5 |
| X | 80 | 67.5 |
| Y | 100 | 62.5 |
| Z | 120 | 60 |
| | | Av income:\$ 20000 |

Demand curve

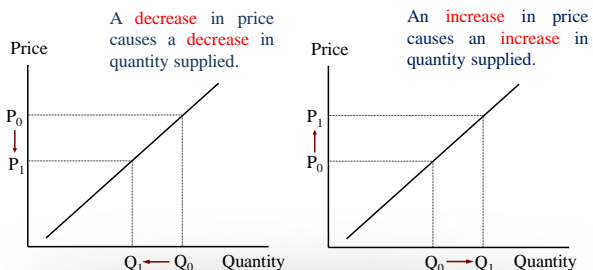


Supply

- Every market has a demand side and a supply side
- The **supply** of a good or service is defined as quantities of a good or service that people are ready to sell at various prices within some given time period, other factors besides price held constant.
- Supply curves are drawn on the assumption of technology and input or resources (as such labour, capital and land) and prices.

Law of Supply

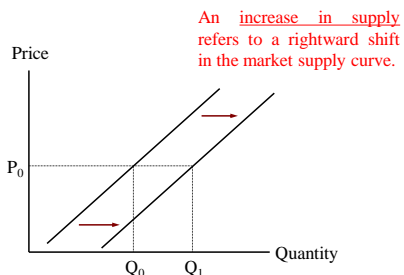
The direct relationship between the price of the commodity and the quantity supplied per period is referred to as the law of supply.



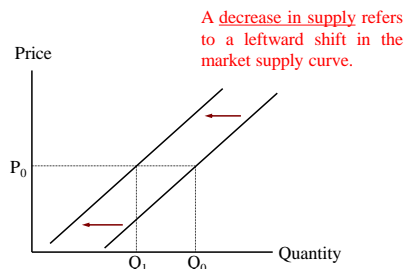
Nonprice determinants of supply

- What impact on the market in Poland has:
 - The bank's collapse in the US?
 - The so-called "Arab Spring"?
 - Government coup in Côte d'Ivoire?
- What was the relation between the Pope and the fish and meat markets in Italy in XX century?

Change in Supply



Change in Supply

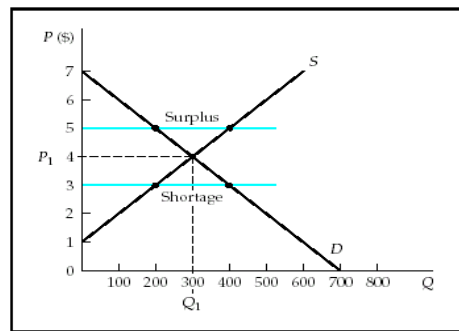


Market Equilibrium

- **Market equilibrium** is determined at the intersection of the market demand curve and the market supply curve.
- **Equilibrium price:** The price that equates the quantity demanded with the quantity supplied.
- **Equilibrium quantity:** The amount that people are willing to buy and sellers are willing to offer at the equilibrium price level.
- **Shortage:** A market situation in which **the quantity demanded exceeds the quantity supplied**.
 - A shortage occurs at a price below the equilibrium level.
- **Surplus:** A market situation in which **the quantity supplied exceeds the quantity demanded**.
 - A surplus occurs at a price above the equilibrium level.

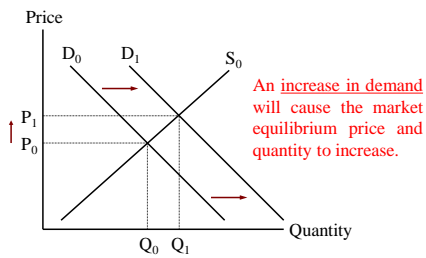
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Market Equilibrium



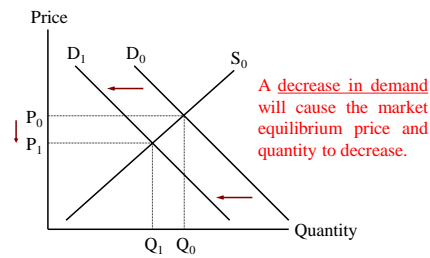
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Market Equilibrium



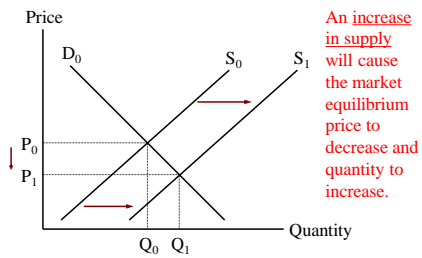
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Market Equilibrium



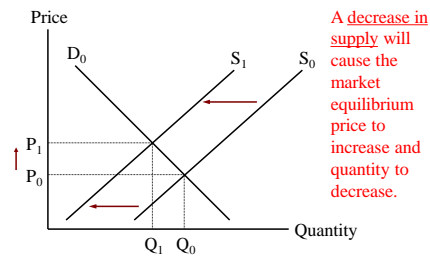
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Market Equilibrium



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Market Equilibrium



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Analysis of demand

- What do we know?
 - Simple model of profit maximization, which allows to determine the optimal price level as well as optimal production level and, therefore, optimal profit
- What we are going to do?
 - Analysing a more complex model: many variables determining demand, sensitivity of demand for changes of these quantities (elasticity).

Analysis of demand - example

- Aim: to analyze the demand for flights on the Texas - Florida route in the economy class.
- What determines the demand?

$$X = f(P, Y, P_c)$$
- setting variables
 - X → number of tickets sold in economy class
 - Y → income level expressed as an indicator (year / base month = 100)
 - P → price of the ticket in economy class
 - P_c → price of a ticket in a competitor airline
- Remark:
 - Y is an income indicator. Base year = 100, so if the indicator = 105, it means that the income increased by 5%

Demand as a function of several variables

- Demand equation for airline tickets of "our" airline per flight :

$$X = 25 + 3Y + P_c - 2P$$

- The equation shows that:
 1. Increment of the income indicator by 1% will result in sales increase by 3 tickets.
 2. Every increase of the competitor's ticket price by 10 dollars will increase the sale by 10 tickets.
 3. Any increase of the ticket price by "our" line by 10 dollars will result in a decrease in sales by 20 tickets.

Interpretation of the demand equation:

$$X = 25 + 3Y + P_c - 2P$$

- The equation shows that:
 1. Increment of the income indicator by 1% will result in sales increase by 3 tickets
- the output equation (in the place of unknowns we substitute 100):
 - = $25 + 3 * 100 + 100 - 2 * 100$
 - ↓
 - = $25 + 3 * \dots + 100 - 2 * 100$

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- the output equation (in the place of unknowns we substitute 100):
 - = $25 + 3 * 100 + 100 - 2 * 100$
 - ↓
 - = $25 + 3 * 100 + 100 - 2 * \dots$

- If, on the other hand, we want to show the total change in demand resulting from changes in all variables, then we can write:

$$\Delta X = \Delta 3Y + \Delta P_C - \Delta 2P$$

- Now we can change all variables:
- Example:
 - If the income increases by 5% and the prices of all tickets drop by 15%:

$$\Delta X = 3 \cdot \dots + 1 \cdot (\dots) - 2 \cdot (\dots)$$

$$\Delta X = \dots$$

Substitute a ...% change, not a% change

- This means that "our" airline should sell an additional 30 seats in economy class for each flight.

Let's get back to the equation:

$$X = 25 + 3Y + P_C - 2P$$

- What information does this equation provide about the **current state** of demand?
- Let's assume that:
 - $P_C = P = 240$ and income indicator = 105
- How many tickets for each flight should we sell?**

$$X = 25 + 3(105) + 1(240) - 2(240) = \dots \text{ seats}$$
- With this equation and given parameters, "our" airline should sell seats in economy class for each flight.



Exercise 1

- Using the equation $\Delta X = \Delta 3Y + \Delta P_C - \Delta 2P$
- calculate the volume of change in the volume of tickets sales when:
 - $\Delta Y = -8$
 - $\Delta P_C = 12$
 - $\Delta P = 20$
 - $\Delta X = ?$

$$\Delta X = \dots$$

$$\Delta X = \dots$$



Demand curve and change of its position

Demand function: $X = 25 + P_C + 3Y - 2P$

- Draw a demand curve
- Check what will be the effects of changes in our "ticket price".

Assumption: the competitor's ticket price (240) and the income indicator (105) do not change - **why ?????**

- to investigate the effects of "our" price change

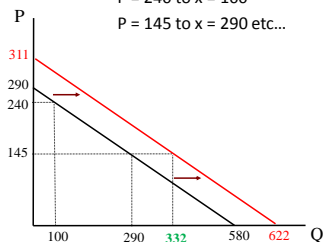


$$X = 25 + 3Y + P_C - 2P$$

$$X = 25 + 3(105) + 240 - 2P$$

$$X = 580 - 2P$$

Changing the ticket price is moving along the curve D.
 $P = 240$ to $x = 100$
 $P = 145$ to $x = 290$ etc...



What happens when one of the other factors determining demand changes?
 Ex: it is expected that next year an income increases to $Y=119$
 New function of demand is: (please calculate):

$$X = \dots$$

With increasing income, demand will increase!

Q: How many tickets will be sold in the new situation at the price (P) = 145 ???

$$X = \dots$$

What else we learn from the change in income and demand function?

- $Q_0 = 580 - 2P \Rightarrow P = 290 - Q/2$
- $Q_1 = 622 - 2P \Rightarrow P = 311 - Q/2$

- What is the conclusion for a company?**
 - If price const at $P=145 \Rightarrow$ increase of tickets sold by 42
 - But if the goal of the airline is to maintain the current sales volume for the year, it can raise the price of the ticket by ?

Answer: