



Course: Economics I

Author: Ing. Martin Pop

Contents:

Introduction

1. Perfectly competitive firms supply

1.1 Perfectly competitive firms assumptions

1.2 Perfectly competitive firms balance

1.3 Effect of costs changes and other factors on the supply

1.4 Elasticity of supply

1.5 Market supply

2. Equilibrium in a perfectly competitive market

2.1 Market equilibrium

2.2 Market Efficiency of perfect competition

2.3 Effect of changes in demand and supply on market equilibrium

Conclusion

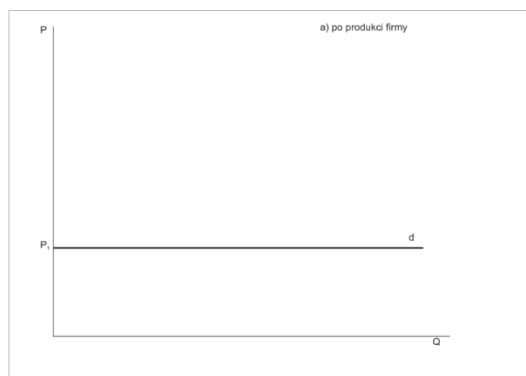
1. PERFECTLY COMPETITIVE FIRM SUPPLY

1.1 Assumptions perfectly competitive firms

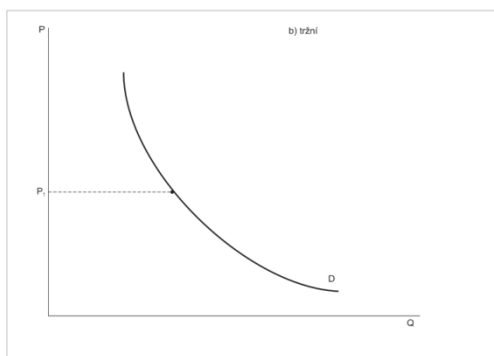
- price independence to the company production volume
- homogeneous product
- perfect long-term mobility of PF
- perfect information for all consumers and firms
- large number of companies,
- no barriers to entry into the industry

1.2 The balance perfectly competitive firms

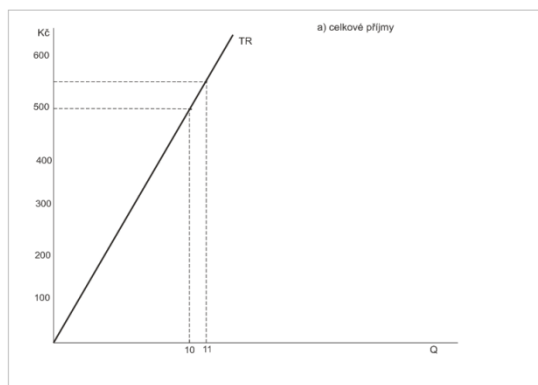
- The most important feature of perfect competition is the independence of prices on production volume. Price is constant - the total revenue depends on the volume of production and is directly proportional.



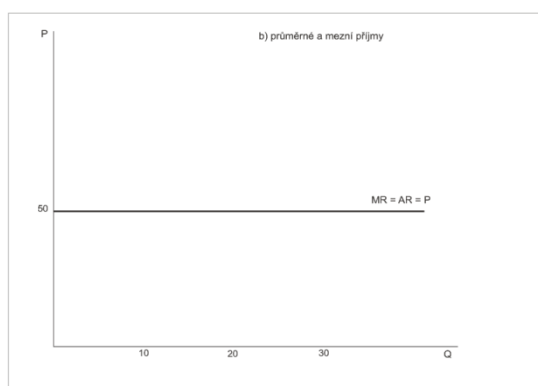
Graph n. 1: Demand curve for companies production



Graph n. 2: Market demand curve

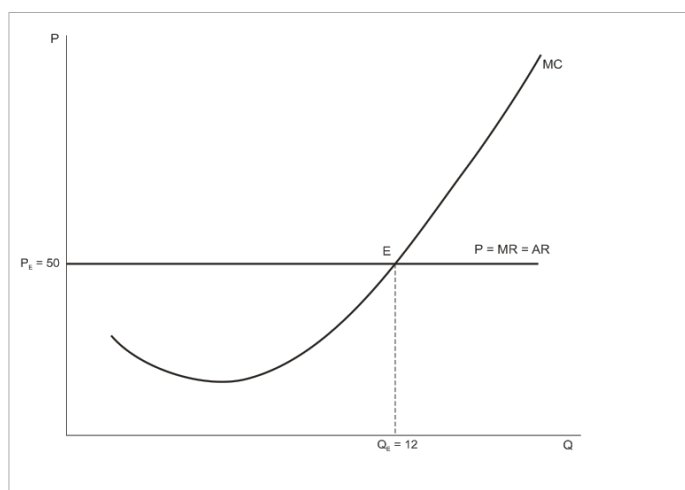


Graph n. 3: Total revenue in perfect competition

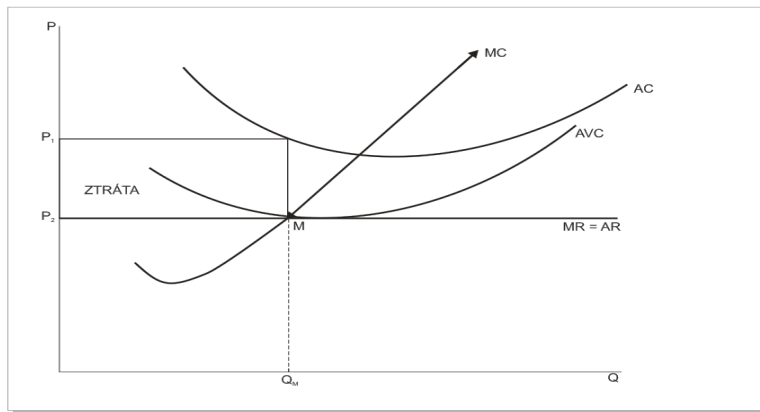


Graph n. 4: Average and marginal revenue in perfect competition

- If the price is constant, total revenues depend only on the volume of production and it is directly proportional.
- In perfect competition, average income is constant. AR curve is a straight line parallel to the x-axis at the level of prices.
- Marginal revenue is equal to the AR. The MR curve is therefore identical with the AR curve.
- Marginal revenue is the change in total revenues due to changes in the output of the unit. **$MR = DTR / DQ$, for small changes in $MR = \delta P / \delta Q$.**
- The relationship of average and marginal revenue pays analogous relationship as the average and marginal costs.
- TR, AR and MR curves depend on the character of competition.
- Condition of company equilibrium **$MR = MC$** so we can write for perfect competition as follows: **$MC = P = AR = MR$.**
- In this point the company achieves maximum profit. At the same time there is the highest difference between total revenue and total costs.



Graph n. 5: Perfectly competitive firm optimum (equilibrium)



Graph n. 6: Shut down point (with the loss)

1.3 Supply and point shut down point of the company in the short term

If we want to derive individual supply curve, we must see how the company responds to changes in price. We know that price is independent of the behavior of one company.

We know that for each price level, there is an equilibrium level of production of the intersection of MR and MC curves. Marginal cost curve (resp. its growing part - as will be explained below) is simultaneously the supply curve.

But what happens if total costs are higher than the total revenue and the company therefore has a loss?

TC > TR

In short period the company will continue in production, up to the point where:

TR = VC

The company stops production at the point where price equals average variable costs.

This is because the true $TR = VC$ must pay:

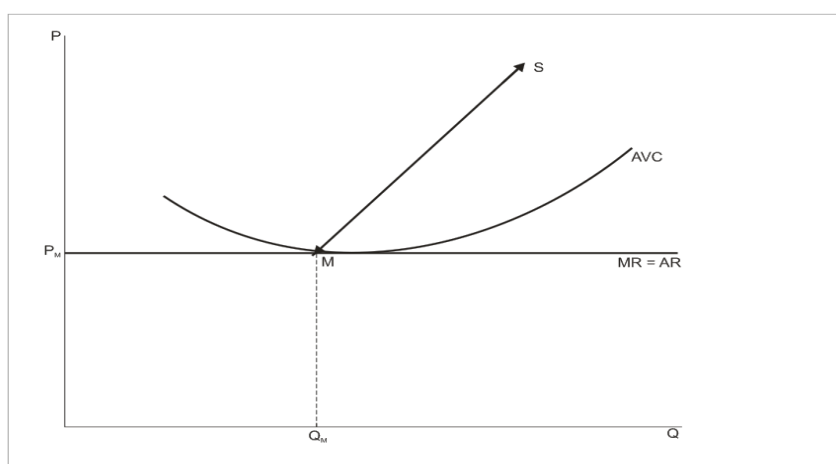
$$TR / Q = VC / Q \quad \text{and thus} \quad P = AVC$$

This condition is only met in the point of minimum average variable cost. Relationship of marginal and average variable cost implies that only this point may be true:

$$AVC = MC = P$$

The point at which this condition is satisfied, we call the point of the company shut down.

Firms supply curve is identical to the marginal cost curve from the point where the marginal cost (and hence price) equals to the average variable costs.



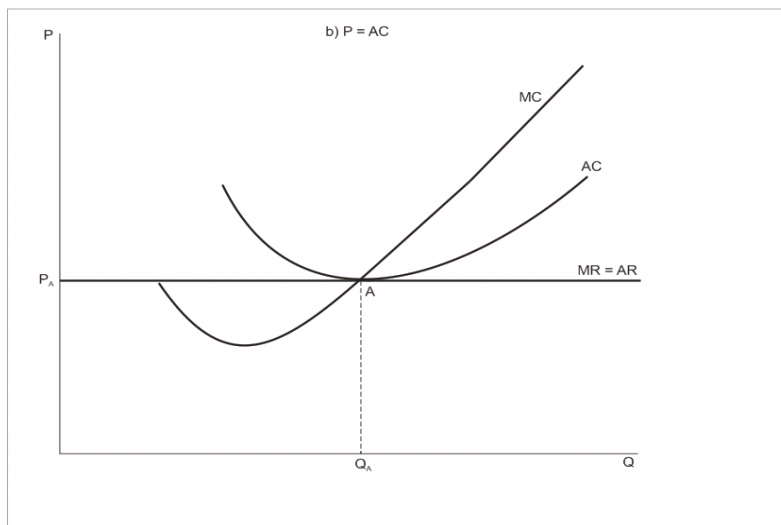
Graph n. 7: Shut down point and supply curve

The breakeven point

Equilibrium condition of the company and the industry in conditions of perfect competition is:

$$MR = MC = AC = AR \quad \text{or} \quad P = MC = AC$$

The breakeven point corresponds to the minimum average costs



Graf č. 8: The breakeven point

1.3 Effect of changes in the cost and other factors on supply

Price change causes a change of the offered quantity - shift the curve supply.

The supply curve shift can be affected by many factors.

Supply primarily affect changes in costs:

- costs increase causes a decrease in supply - shifting the supply curve to the left
- costs reduction on the contrary causes an increase in supply - shifting to the right.

Changes in costs caused by:

- Technical progress,
- Input prices.

The supply is also affected by changes in prices of other goods and other factors.

1.4 Supply elasticity

Price elasticity of supply

Calculation of the price elasticity of supply is analogous to the elasticity of demand:

Supply elasticity = % change in supplied quantity / % change in price

The coefficient of price elasticity of supply is:

$$ES = \frac{Q_2 - Q_1}{(Q_1 + Q_2) / 2} \cdot \frac{P_2 - P_1}{(P_1 + P_2) / 2}$$

Supply:

- Elastic,
- Nonelastic
- Unitary elastic,
- Perfectly elastic,
- Perfectly inelastic.

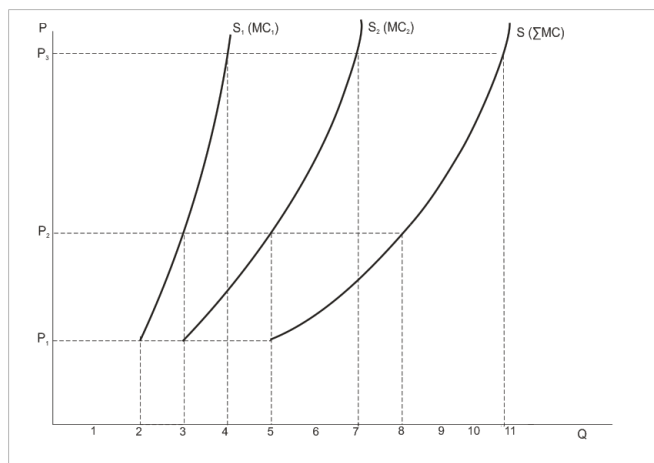
The main factors affecting the price elasticity of supply:

- Possibilities and costs of storage,
- Character of technology and production process,
- Time horizon.

1.5 Market supply

The market supply is the sum of volumes of certain goods that manufactures are willing to offer at different levels of prices.

Graphically we can get the market supply curve as horizontal sum individual supply curves.



Graph n. 9: Market supply curve derivation

Aggregate supply

The sum (aggregation) of market offers in all markets.

Aggregate supply is the sum of all goods in the economy, which are producers willing to offer at various price levels. If we analyze the relationship between the amount of offered goods and the price level, we can construct the aggregate supply curve.

2. PERFECTLY COMPETITIVE MARKET EQUILIBRIUM

2.1 Market equilibrium

Market equilibrium occurs when the offered amount equal to demanded volume. This volume is called the equilibrium quantity. Price which induces from the equality is called the equilibrium price.

Optimum of a consumer - **$P = MU$**

Optimum (balance) of a company **$P = MC$**

We know the optimum conditions of the demand and supply:

$P = MU$ and $P = MC$ and hence $MU = MC$

Market equilibrium therefore occurs when the marginal utility of goods equals the marginal cost of its production.

2.2 Perfect competition market efficiency

Balance and efficiency

Efficient allocation of factors of production becomes when there is no possibility to increase the production of one good without reducing the production of other goods. At the same time no economic entity can not improve its situation without worsens the situation of others.

If marginal utility of a good is higher than marginal cost, it means that this product is produced (and consumed) a little. Its marginal utility is higher than the cost required to acquire it. Efficiency is increased by transferring a part of production factors

to produce this farm.

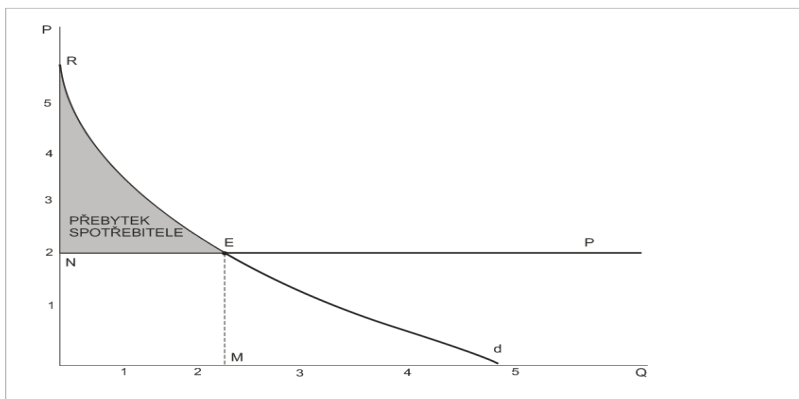
- If $MU = P > MC$, companies are not in equilibrium,
- If $MU > P = MC$, consumers are not in equilibrium.

Exchange advantages

Market not only ensures the efficient allocation of factors of production, but also benefits for economic entities, so-called consumer surplus and producer surplus.

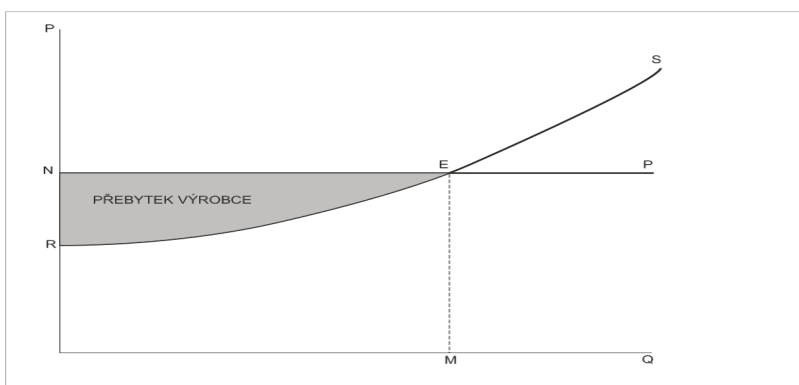
In explaining the consumer surplus we emerge from the known facts. Price is for the consumer information, according to which he decides, how many goods to purchase.

We know that price must be equal to the marginal utility of the last unit of the consumed goods. This creates a difference between the total benefit and total expenses for the purchase, which we call **consumer surplus**.



Graph n. 10: Consumer surplus

Producer surplus is the difference between total revenues and variable costs.



Graph n. 11: Producer surplus

2.3 Effects of changes in demand and supply on the market equilibrium

In reality, market conditions are constantly changing and the balance is rather rare.

Generally, the changes in supply or demand (and appropriate curve) are leading to a change of the equilibrium quantity and equilibrium price. We will focus on for the following cases:

- supply response to changes in demand, depending on the time
- outcome of current changes in supply and demand depending on the elasticity of supply and demand,
- restoring the balance provided supply time delay depending on the slope of supply and demand curves.

List of tasks for students:

1. The company manufactures in terms of perfect competition has a total daily revenue of 10 000 CZK. At this level of production firm maximizes profit, the average cost is 20 CZK, marginal costs 40 CZK and average variable costs 15 CZK. Determine the level of production (in physical units). Next, determine the size of the total profits if a company realizes.
2. Calculate the maximum profit (resp. Min. Loss) for the firm maximizes profit where: $TR = 40Q - 2Q^2$ and $Q = AC + 10$
3. Perfectly competitive market. The normal price of firewood is 70 CZK per yard, short-term TC is described by a function: $TC = 800 + 16q + q^2$, where q is the number of yards per month. At what output is to maximize profits? Calculate the short-term gains (or losses).

References and further reading:

- MACÁKOVÁ, L. aj. *Mikroekonomie – základní kurs*. 10. vyd. Praha: Melandrium Slaný, 2007. ISBN 978-80-86175-56-0. s. 12-45.
- SIRŮČEK, P., NEČADOVÁ, M. *Mikroekonomická teorie 1 – cvičebnice*. 1. vyd. Praha: Melandrium Slaný, 2001. ISBN 80-86175-17-0. s. 11-62.
- BRADLEY, R. SCHILLER. *Mikroekonomie*. Brno: Computer Press, 2004. ISBN 80-251-0109-6.
- HOLMAN, R. *Mikroekonomie – středně pokročilý kurz*. 1. vyd. Praha: C. H. Beck, 2002. ISBN 80-7179-737-5.
- HOLMAN, R. *Ekonomie*. 3. vyd. Praha: C. H. Beck, 2002. ISBN 80-7179-681-6.
- TULEJA, P., NEZVAL, P., MAJEROVÁ, I. *Základy mikroekonomie* (Učebnice pro ekonomické a obchodně podnikatelské fakulty). 1. vyd. Brno: Nakladatelství CP Books, a. s., 2005. ISBN 80-251-0603-9.
- Translated on the basis of Ing. Lenka Brizgalová, Ph.D documents.