



Course: Economics I

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1. PRODUCTION FACTOERS

LAND

- Product of nature,
- It is not a free good (because of limitations on quantity)
- Different fertility
- Convenience - the disadvantageous position
- Agriculture - non-agricultural use
- Natural resources (minerals, precious metals, fuels, trees)
- Revenue from land - land rent

WORK

- Human activity with its specifics
- Is limited to non-economic:
 - The amount of (physical and mental characteristics, the number of people willing to work)
 - Quality (physical and mental characteristics)
- Income arising from work – wage

CAPITAL

- Result of previous production
- May be tangible or intangible nature
- Result of its applying is the profit or interest

Technology:

- Special form of capital
- Neither in the form of material goods (the idea, the original procedure)

2. MARKET PRICES FORMATION

Market of production factors has some of the same patterns as the market of products and services market. It has the same shape of the curves of supply and demand, the principle of law of decreasing demand and increasing supply.

The demand for production factors

Is derived from the demand for goods whose production is the production factor used (demand for the reporters depends on the demand for newspapers).

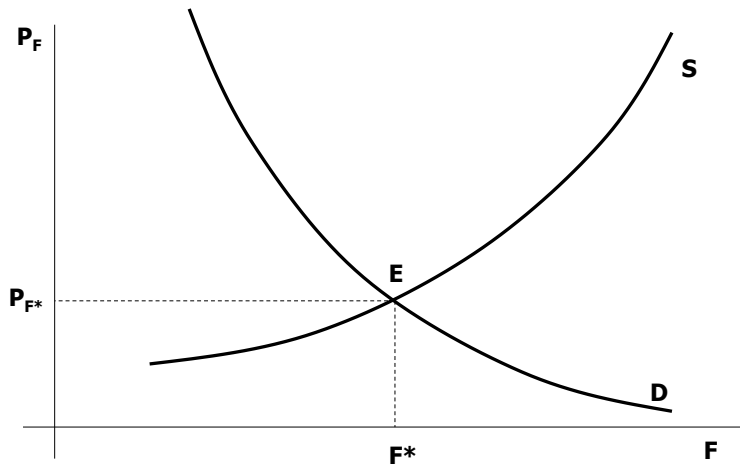
Supply of production factors

Their owners are households who are trying to maximize their profit. It is necessary to distinguish between supply factor throughout the economy and supply factor individual enterprise. The owners' decisions are based on marginal costs. Supply curve is increasing.

Price elasticity of the supply curve depends on:

- Possibilities of increase the disposable number of factors
- Alternative use of that factor:
 - Universal
 - Unique
 - Special

Market of the production factor



Graph n.1: Production factor market

Production factor price

Price is connected with the service of this factor (with its lease).

- In the case of **labor**, paid for its service wages and the price of this service is the **wage rent**
- In the case of **land**, paid rents and the price is the **rate of land rent**
- In the case of **capital**, paid interest and the price is the **interest rate**

The length of time and the conditions of competition (perfect, imperfect) are the main factors influencing production factors markets.

3. TRANSFER EARNING AND ECONOMIC RENT

Transfer earning – is the earning, in which the given input would obtain at its best alternative use. It is thus the amount that must be acquired in order to move its service to another use.

Economic rent - part of the earnings of the input that exceeds the transfer earnings.

Pure economic rent – is an income paid for a service of the production factor with fixed supply (for example the income of the people with special abilities such as scientists, actors, athletes ...)

Land rent - rental price of land. Certain land uses provides land rent. If the total supply of land is fixed (perfectly inelastic) and there is no other possibility of its use.

Land rent may arise when:

- particular crop
- extraction of raw materials
- building plot

Land is a product of nature that exists in a limited range. Its quality is different, which is reflected in the difference in fertility. Certain land use brings land rent if the total supply of land is fixed and there is no other possibility of its use.

Changes in income are determined only by demand. The increasing demand for land is directly projected into increasing rate of land rent and to increase of the total land rent.

4. FIRMS DEMAND FOR PRODUCTION FACTOERS

The company decides on the factor market what inputs and in what quantities to demand. This decision is determined by the company's aim to maximize the profit = produce with the highest revenues and at the same time at the lowest costs.

The demand depends on:

- What is the revenue of production factor (productivity and price of the product created by this production factor)
- Cost on the given factor

Marginal revenue of product (MRP)

- each additional unit of input can bring an additional income
- amount of revenue determines:
 - Increase of the product created by an additional unit
 - Increase of the revenue that the company gains from the sale of this product

In conditions of perfect competition in the product market and services is the income increase same as the price.

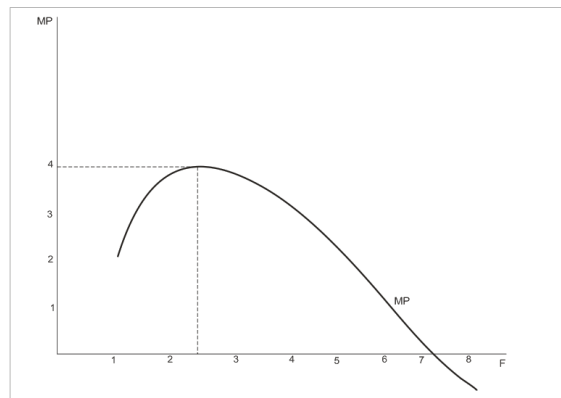
- This means that each additional unit of input can bring the company additional income.

Its amount is determined by:

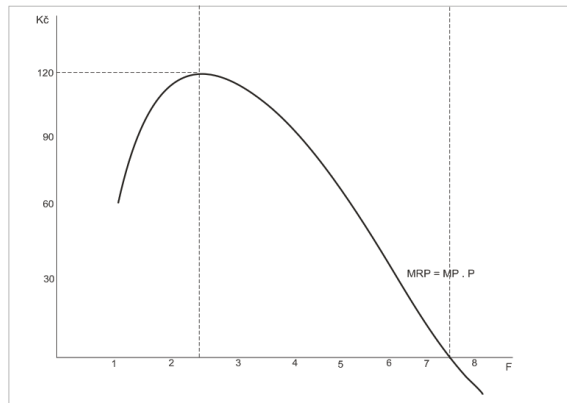
- Marginal physical product
- Price of the product
- This increase is called the marginal revenue product

- Marginal revenue product (MRP) - is additional income that a company receives by selling products created by involving an additional unit of input into production, while other inputs remain constant.
- It expresses the change in total revenue when using additional unit of input.
- In conditions of perfect competition in the market for products and services market the company can not affect the market price of its product. The price at which their goods are sold is constant.
- MRP change responses only to changes in marginal physical product.

$$\text{MRP} = \text{MPP (marginal product)} * P \text{ (price)}$$



Graph n. 2: Marginal product



Graph n. 3: Marginal product revenue

Marginal cost of production factor (MFC)

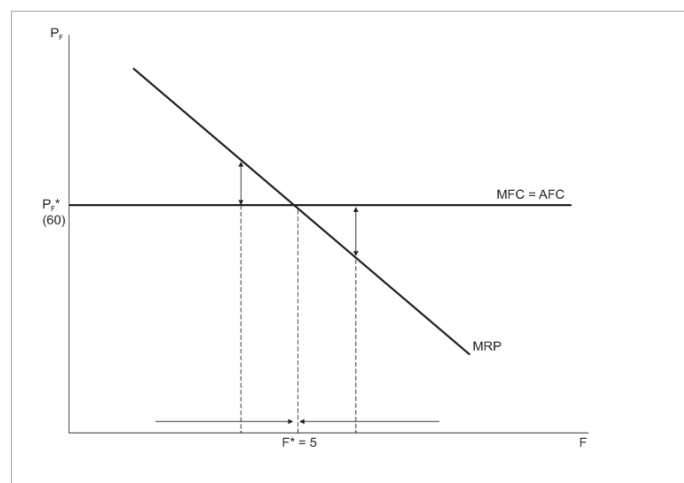
- The amount of production factor, which the firm hires depends not only on the revenues but also on costs.
- MFC - are additional costs that arise when the company hires additional unit of production factor.
- In a perfect market competition firm hires inputs at prices determined by the market - the firm accepts the market price.
- The company is hiring so small share of the input that its activities can not affect its price.
- The curve presenting the development of the marginal cost of production factor depends on the number of factors. Therefore it is a horizontal line.



Graph n. 4: Marginal cost of production factor

Optimum (equilibrium) of perfectly competitive firm

The company is in optimum if the income of the marginal product of factor coincides with the marginal cost of production factor - **MRP = MFC**



Graph n. 5: Optimum (equilibrium)

If $MRP > MFC$, firm hires additional unit of the production factor and expands the production to the level at which marginal revenue product falls to the marginal cost of production factor.

If $MRP < MFC$, the company reduces the rent of production factor and reduces production. MRP rises to the level of marginal cost for a given factor.

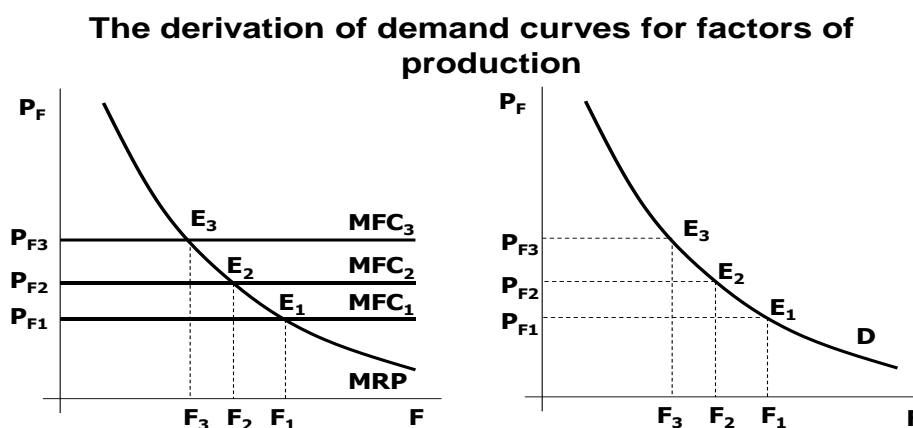
MRP (marginal revenue product) = (MFC marginal cost of production factor) = PF (price of production factor)

MRP (marginal revenue product) of land = rate of land rent,

MRP (marginal revenue product) = wage rate,

MRP capital (income from marginal product) = interest rate.

Demand for production factors



Graph n. 6: Derivation of demand curve

Change in demand for production factors

At each level of the production factor prices will be hired certain amount of this factor.

This change can be caused by three factors:

- changes in demand for final output
- number of other inputs
- changes in technology

5. COMPANY DEMAND FOR INPUT IN IMPERFECT COMPETITION

- Is determined by MRP
- Size MRP of the input depends on the conditions of competition
- MRP of the production factor is the multiple of MPP and MR, obtained through the sale of additional units of goods

MRP (marginal revenue product) = MPP (marginal product). MR (marginal revenue)

6. LABOUR MARKET IN CONDITIONS OF PERFECT COMPETITION

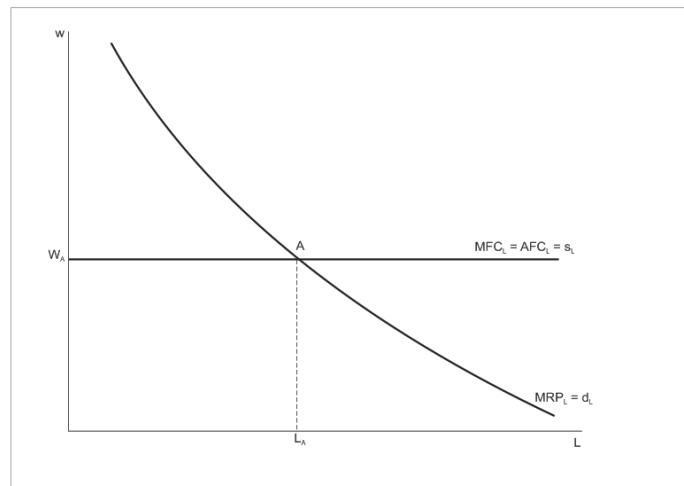
Perfect competition assumptions:

- a lot of inquiring and offering subjects
- no company can influence the price of labor (Wages)
- perfect mobility, perfect information
- firms maximize profits, households maximize utility
- labor is homogeneous
- marginal cost of labor factor is equal to the wage rate - $MFCL = w$
- the average cost of labor factor is equal to the wage rate - $AFCL = w$
- individual labor supply curve is horizontal at the level of wage rates

Labor demand

Labor demand is determined by the amount of work hired at different levels of wage rates. The company demands the amount of labor in which MRPL equals to MFCL (wages). Demand thus greatly affects labor productivity (which is influenced by the qualifications, quality and quantity of co-operating factors, technologies and management).

Marginal revenue of the product of labor (MRPL) is a multiple of the marginal physical product of labor (MPPL) and prices (P). Labor demand curve is derived from the MRPL curve.



Graph n. 7: Labor demand curve

Labor supply

Labor supply means the number of worked hours in different companies. Labor is the factor of production whose bearer is the man. The goal is to maximize consumer benefits.

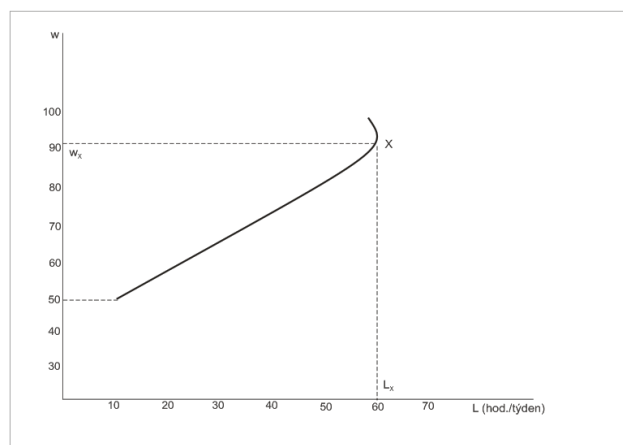
Substitution effect

At a higher wage for each hour of work brings higher earnings, which the consumer can use to obtain a larger number of products and services. This leads to a tendency to work longer at the expense of the free time. It is a replacement of the free time by work.

Income effect

Higher wages leads to the substitution of work by leisure time. And because the consumer already has sufficient income, he wants more free time.

Individual labor supply curve – is in its certain parts recurved back. This is caused by the income effect. Worker at a higher salary initially prefer to work prior to free time, but if his salary exceeds a certain level worker tries to work for fewer hours.



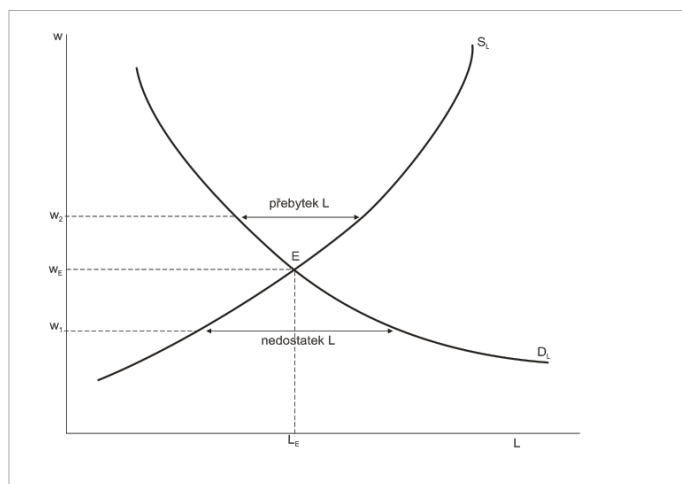
Graph n. 8: Individual labor supply curve

Equilibrium in the labor market is formed during balancing supply and demand. Equilibrium wage is determined by the intersection of the market demand curve and the market supply curve.

The market demand curve is the horizontal sum of the individual curves of all firms in the market.

The market supply curve is no longer curved back because of:

- for each individual curves are backward curvature at different points. The sum will compensate it.
- increasing wage attract new workers with higher transfer earnings.



Graph n. 9: Labor market equilibrium

Wage differences between different groups of workers

There are wage differences between different groups of workers.

We can distinguish:

- nonequilibrium differences - reflecting changes in the development of various industries.
- equilibrium differences - are explained by the lack of mobility of resources and market segmentation, differences in the length and cost of preparation for employment, differences in non-monetary benefit of a certain job or differences in the quality of work.

7. LABOUR MARKET IN THE IMPERFECT COMPETITION

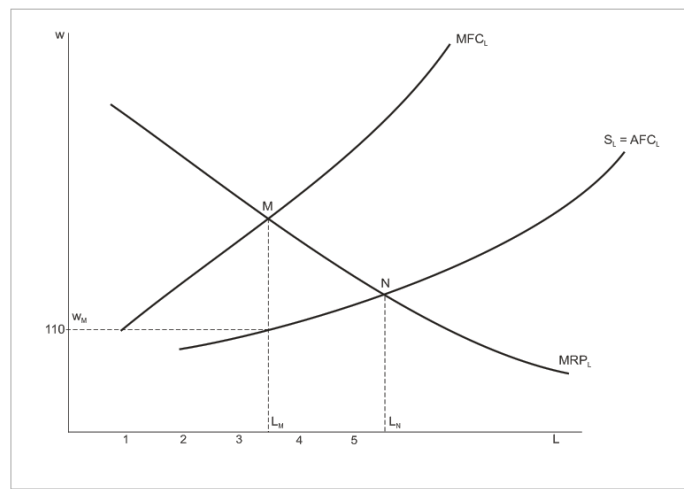
The basic imperfections in the labor market include:

- wage rigidity,
- wage tariffs of firms
- restrictions caused by collective agreements, labor-law legislation and market influences.

The main symptoms of imperfect competition are monopsony and operation of trade unions.

Monopsony is a monopoly on the side of demand - companies in the labor market.

This monopoly occurs when there is a single dominant firm employing working-age population in the area. Firm may affect wage rates.



Graph n. 10: Monopsony

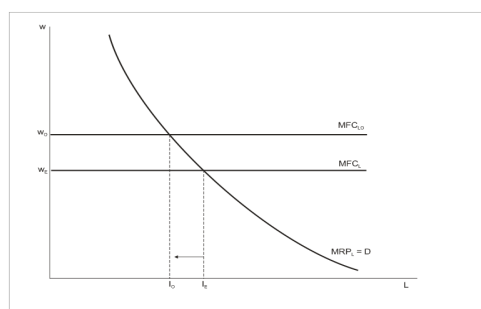
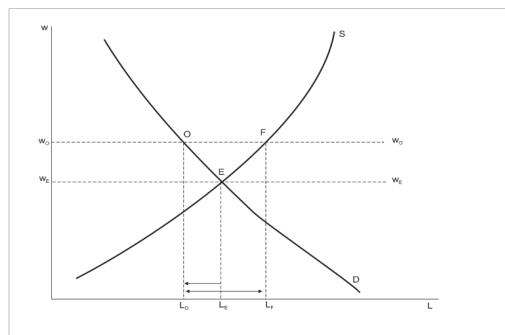
Trade unions in the labor market

The effect of trade unions is monopoly power on the part of the supply - workers.

Trade unions are associations of workers seeking higher wage rates and better working conditions for its members. There are ways in which unions seek wage increases and these are as follows:

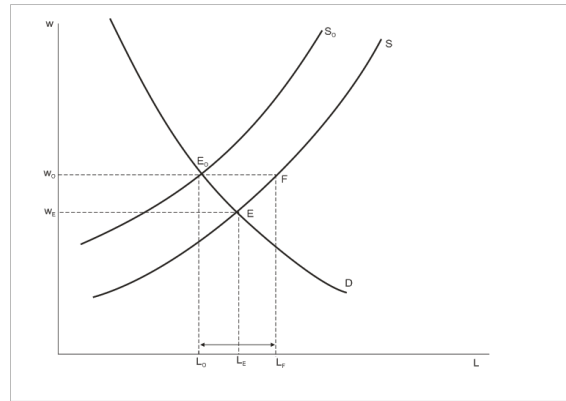
- **Increased standard wage rates (wage threshold)**

Trade unions in collective bargaining agree with the company the minimum wage rate that exceeds the equilibrium rate in the market. Thus reduces the labor demand. Trade unions agree that the company will hire only union members.



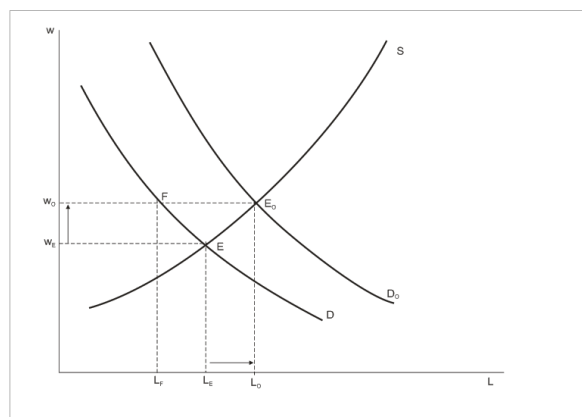
Graph n. 11,12: Wage treshhold effect

- **Labor supply restrictions** reflected in the shift of labor supply to the left. It is necessary that the unions have achieved the company employing only trade unionists and limit the number of trade unionists.



Graph n. 13: Labor supply restriction

- **Increased labor demand** shows the shift in labor demand curve to the right. Unions achieve demand increase by convincing consumers to greater consumption and limiting sales of competition. This leads to the increase in wages and employment.



Graph n. 14: Labor demand increase

8. CAPITAL MARKET

Capital consists of manufactured goods, which are again used as production inputs for further production. The basic feature of capital is that it is both input and output.

There are three main categories of capital goods:

- buildings,
- equipment,
- supplies.

Capital goods are not consumed in the production process at one time, but operate over a longer period.

Capital market demand

Companies goal is to achieve the maximal profit - $MRP = MFC$.

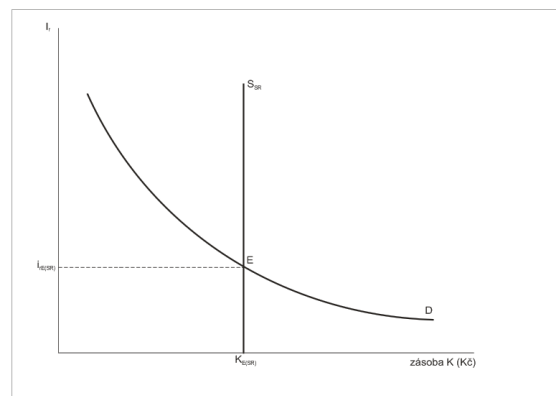
In a perfectly competitive market MFCC equal to the interest rate. Demand curve is determined by the curve of the marginal revenue product, which is a multiple of the marginal revenue (here the interest rate) and marginal physical product of capital. Demand for capital is a decreasing function of the interest rate and is determined by MRPC. Demand is derived from the demand for final goods, which are manufactured using the capital.

Capital market supply

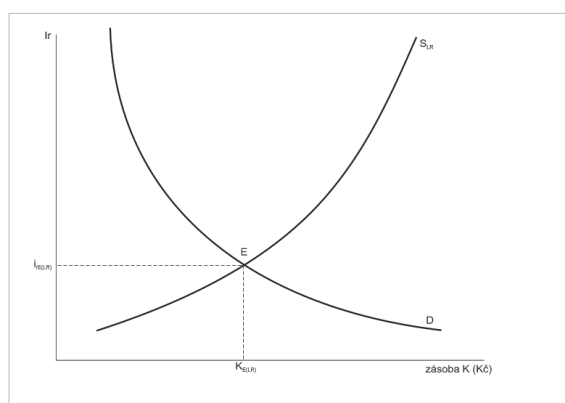
Is determined by savings. Savings represent the part of households' disposable income, which was not spent on consumption and was offered in the capital market to firms to purchase capital goods.

The supply of capital is different in two aspects:

- in the short run – is given the exact amount of savings due to the households offer. Because of the constant savings the capital supply curve is vertical.
- in the long run - households already respond to changes in the interest rates and the levels of savings are different.



Graph n. 15: Capital market equilibrium in the short run



Graph n. 16: Capital market equilibrium in the long run

List of tasks for students:

1. Graphically display the optimal amount of the labor in these four cases:
 - The firm sells its output in a perfectly competitive market and demands a labor in a perfectly competitive labor market;
 - The firm sells its output in a perfectly competitive market and demands a labor in imperfectly competitive labor market;
 - The firm sells its output to the imperfectly competitive market and demands a labor in a perfectly competitive labor market;
 - The firm sells its output to the imperfectly competitive market and demands a labor in imperfectly competitive labor market.
2. Describe TPL, APL and MPL. Write a function of MPL and in perfect competition labor market.
3. Graphically express and explain the equilibrium in the labor market.
4. Company sells its product in a perfectly competitive market for 10 CZK. Production function has the form: $Q = 17L - L^2$. Determine the optimal amount of labor, if the price of labor is given at 50 CZK / h.
5. MPP inputs A, B, C are 12, 8, 2. The prices of these inputs in a perfectly competitive are 6, 4, 1 CZK / pc. The company at a given level of output maximizes profit. What is MR from the sale of the last unit?
6. Marginal revenue is equal to CZK 2. Prices of input units A, B and C on perfectly competitive markets are 8, 4 10 CZK. Company at a given level of output maximizes profit. What is the MPP of the input B?
7. Labor demand is given by the equation $DL = 1200 - 10 w$; labor supply $SL = 20 w - 300$.
 - a) Calculate the equilibrium quantity of labor and the equilibrium wage rate.
 - b) Calculate the size of the economic rent transfer earnings.

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