Course: **Economics I**

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Contents:

1. UTILITY AND ITS MEASUREMENT

Consumption is one of the basic conditions of existence of human society. In the market economy is a crucial part of the power provided through the purchase of market goods and services.

The consumer buys goods to satisfy their needs. Its objective is to maximize the benefits thatit brings consumption of goods and services.

Every consumer on the market performs his choice threw a Consumer basket. This option has two aspects:

• **Qualitative** - a matter of choice are the kind of economic goods,

• **Quantitative** - a matter of choice is the number of different kinds of economic goods.

We assume that the consumer is able to rational considerations. Consumer choice about which specific goods purchases, in what quantities and when it is constrained by many factors.

The basic prerequisite for consumer decision is:

• plenty of different kinds of goods in the market,

• his adequate disposable income,

• physical and time boundaries consumption.

The consumer´s choise is based on the **price of purchased goods** due to the versatility and their needs must take into account also the **prices of other goods**.

The decision to purchase a combination of products also depends on their individual needs, interests and goals, thus the system's individual preferences. Standard consumer behaves when deciding rationally.

Consumer choice is always looking for content (structure) and size (volume) of the consumer basket, which he gives the consumption of most benefit.

In making this decision the consumer compares the situation in terms of consumer preferences. In the theory of consumer demand for individuals assumed to be governed by the axioms of rationality and other behavioral rules, which together form a testable theory of consumer behavior:

• **axiom of completeness comparison,**

• **axiom of tranzitivity**

• **axiom of choice.**

Axioms 1-3 are generally regarded as axioms of rationality. The remaining axioms are already own assumptions concerning the behavior of consumers. These are:

• **axiom of greed**

• **axiom of continuity,**

• **axiom of convexity (preferences).**

Total utility and marginal utility

Total utility (TU) expresses the satisfaction of the consumer from all over the quantity of goods. The total benefit is the sum of the marginal benefits of consumed units of the goods.

It depends on:

• the volume of consumed goods and services,

• the characteristics and quality of the goods,

• the extent to which it is able to meet the needs,

• the subjective relation to consumer goods preferences.

Marginal utility (MU) expresses how much the total benefit will increase if the amountof consumed goods increases by one unit.

Marginal utility depends on:

• the importance and intensity of needs,

• disposable quantity of a particular product.

The difference between total and marginal utility we can best imagine if it is measured in monetary units:

• Total benefit is determined by the maximum amount of money that is for the consumer is willing to pay them,

• Marginal utility is determined by the amount the consumer is willing to spend to purchase additional units of goods.

The current interpretation may be illustrated by the relationship between the amount and the total benefit and the amount and marginal utility.
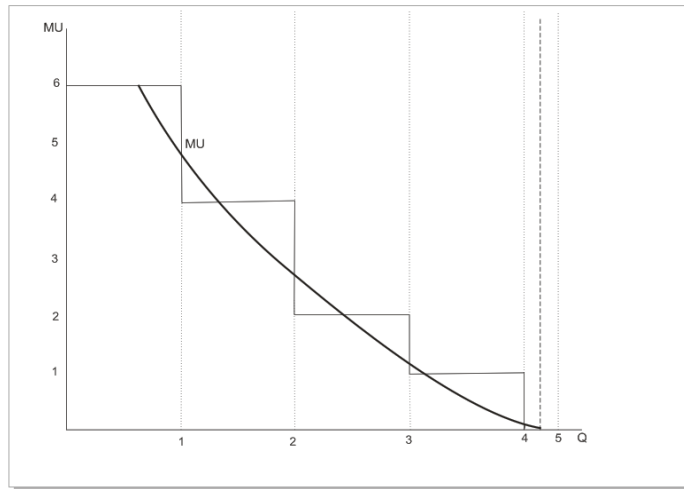
Graph n. 1: Marginal utility

2. CARDINAL VERSION OF MEASUREMENT PROFITS

2.1 Consumer ballance

Cardinalistic version of measurement of utility is based on the assumption that the consumer is able to express his benefit from the consumption of certain good price , what he is willing to pay for this good.

The optimal amount of purchases is, when the marginal benefit equals the price: $MU = P$.

Optimum condition (balance) of the consumer is equal marginal benefits of consumable goods in relation to their prices.

The consumer therefore compares what benefit it will bring money spent on buying individual goods.

Rationally acting consumer can increase his total utility by moving of funds for the purchase of this product. This means that increased consumption of our products will reduce consumption of other goods.
By increasing the amount of consumed goods leads to a decrease of marginal utility, lowering contrary to the growth of marginal utility.
This means that there is a compensation ratio of marginal utility to the price for each consumable goods and the consumer is in equilibrium.

Rationally acting consumer thus increases the volume of purchases of certain goods to the point where the marginal utility of the last unit of money spent on its purchase equal to marginal utility of the last unit of money spent to purchase all other goods.

2.2 Derivation of demand curve

Optimum condition of the consumer...... $MU = P$.

If the price rises, consumers will reduce the volume of purchased goods, if the price drops, the volume of purchased goods increases.

The curve of marginal utility (measured in monetary units) is therefore equal to the demand curve.

Points on the demand curve are corresponding to the optimal volume of purchase of the good at different prices.

The price corresponds to the marginal utility of the last unit purchased the farm.

3 ORDINAL VERSION OF THE UTILITY MEASUREMENT

Is based on the assumption of the consumer's ability to compare the benefits of different combinations of goods.They assume that the level of utility can not be measured, but only sirted on the ordinal scale.

3.1 indifference analysis

The starting point of the indifference analysis is indifference curve (IC).

Indifference curve shows all combinations of goods x and y, which are bringing the same utility. A set of indifference curves is creating so-called **indifference map.**
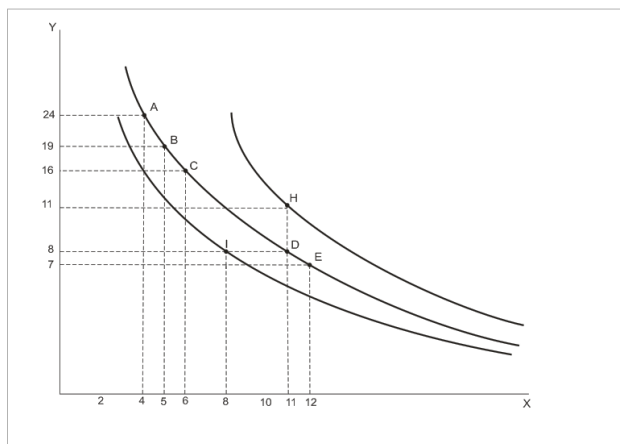
Graph n. 2: Indiference map

Properties of indifference curves:

• are declining - they have a negative slope,

• do not cross - this is connected with the axiom of transitivity,

• are convex to the origin,

• at each point of the image representing the consumer behavior is IC - This relates to the completeness axiom comparison.

WARNING - not always indifference curves are convex toward the origin. Such cases include, for example. Indifference curves for:

• perfect substitutes,

• perfect complements,

• unpopular goods

• neutral goods.

The law of substitution

The law of substitution - is based on the shape of indifference curves. Goods which are becoming rarer, have a higher relative value of substitution. The marginal utility is increasing in relation to the marginal utility of goods, which are becoming more plentiful.

Marginal rate of substitution (MRS) – is the ratio in which they is possible to mutually replaceable X farm and Y farm, without changing the utility.

$$MRS = \frac{increase\ Y}{Increase\ X} = \frac{MU_x}{MU_y}$$

3.2 budget line

Budget line (BL) - shows the maximum available combinations of the distribution of consumers income to purchase two goods.

Revenue line can be calculated   **I = Px + Py * X * Y**

Graph n. 3: Budget line

3.3 Consumer optimum (equilibrium)

The balance of the consumer - connection indifference maps and revenue line. The balanceof the consumer is at the point where the line touches the indifference curve of income.

$$MU_x / P_x = MU_y / P_y$$

• Utility is maximized according to consumer preferences and market opportunities,

• Market opportunities are influenced by disposable income and the prices of consumable goods,

• The rate at which the consumer is willing to substitute one good to others, without changing his utility is equal to the ratio in which consumers can exchange goods X and Y in the market (due to market prices and income).
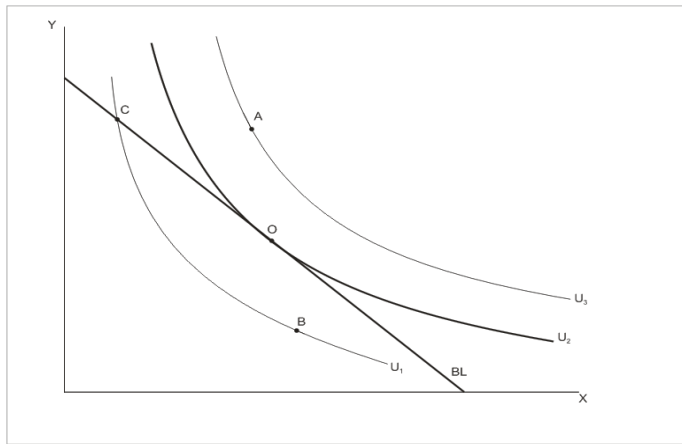
Graph n. 4: Consumer optimum (equilibrium)

3.4 Derivation of demand curve

We consider a price change of only one farm. Changing the price of the good X and unchanged price of the good Y and the same consumers disposable income will affect the budget line slope.

Each prices level of the good X corresponds to other budget line that touches another indifference curve. Each price of the good X corresponds another point of optimal decisions and thus different amount of required quantity of goods X.

On the x axis we find quantity of goods X corresponding to individual points of optimum. We know the demanded amountis corresponding to each level of prices and therefore we can construct the demand curve.

4 DEMAND AND ITS FUNCTIONS

Change in prices, income and prices of other commodities and demand

Income effect - part of the changed demanded quantity of the goods caused by a change in real income consumers due to price changes.

increase of P x → decline in real income → decline Q x

Substitution effect - the effect of price changes resulting from changes in relative prices, which can not be associated with a change in real income. Consumer limits the purchase of goods and increase the purchase of other goods, which are now relatively cheaper.

increase of P x → rise in the relative prices of goods X → decrease Q x and growth in demand for other goods

The resulting effect is the sum of the substitution and income effect.

The growth of nominal income

Causes a shift of the entire demand curve (growth right up, drop down to the left). Changes take effect by type of goods. The **necessary articles** of consumption are only a little sensitive, while **luxury items** are highly sensitive. For special group of **inferior goods** with income growth, demand falls (used cars, front beef).

The effect of changes in prices of other goods on demand:

• **Independent goods** - if the change in price of one good has no particular impact on the demand for other goods,

• **substitutes** - goods are interchangeable. Growth in demand causes prices one after another,

• **complementary goods** – increase of the price of good X causes a decline in demand in the good Y.

Market demand

Market demand curve is a graphical sum of the individual demand curves. Here works the same effects as on the individual demand (changes in prices and incomes - shift curves, changes in quantity - shift the curve, due to changes in individual demand of individual consumers and changing the number of consumers).

Aggregate demand

Is a sum of all sub-markets demands. Aggregate demand is market demand for all goods.

5 DEMAND ELASTICITY

Elasticity of demand measures the sensitivity of the consumer response.

Price elasticity of demand – is expressed as the ratio of percentage changes in volume of demanded goods to percentage changes in prices.

$$\text{price elasticity of demand} = \frac{\%\ \text{change in demanded quantity}}{\%\ \text{change in price}}$$

Price elasticity of demand is measured by the coefficient of price elasticity of demand. Indicates the percentage increases (decreases) of the demanded quantity when the price is reduced by one percent.

$$E_{DP} = \frac{Q_2 - Q_1}{(Q_2+Q_1)/2} : \frac{P_2 - P_1}{(P_2+P_1)/2}$$

Depending on the size of the coefficient of price elasticity of demand distinguish elastic, inelastic or unit elastic demand:

• **Inelastic demand** - EDP <1, the change in price causes a smaller percentage change in the volume of required goods,

• **Elastic demand** - EDP> 1, the change in price causes a larger percentage change in the volume of required goods,

• **unit-elastic** - EDP = 1, the change in price causes the same percentage change in volume demands.
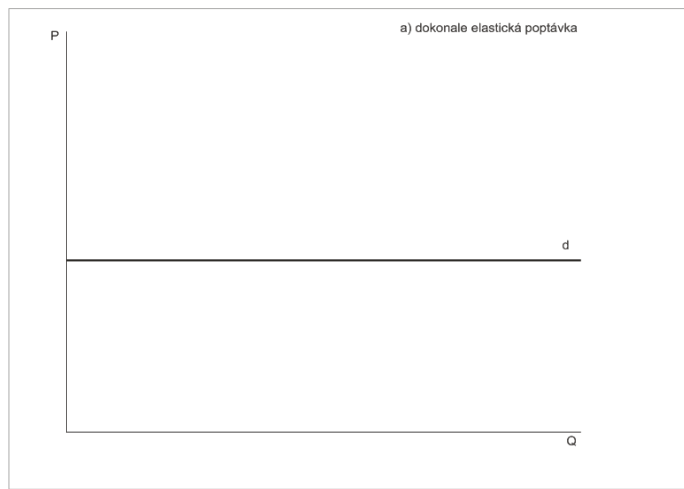
There are two extreme possibilities:

• **perfectly elastic demand** - EDP = infinity,

• **perfectly inelastic demand** - EDP is = 0.
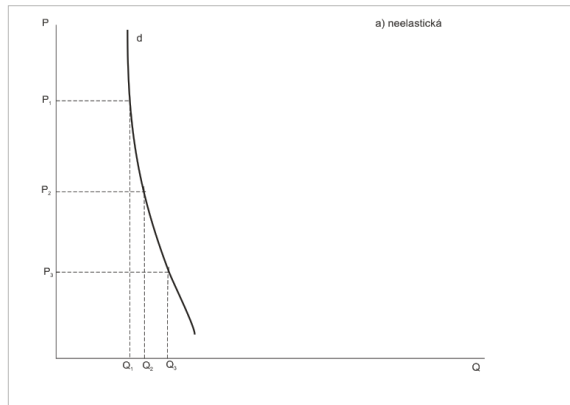
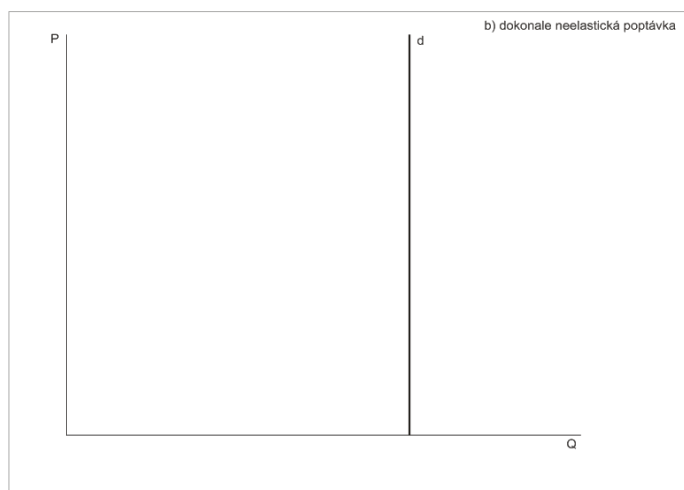Graph n. 5 – Nonelastic demand curve
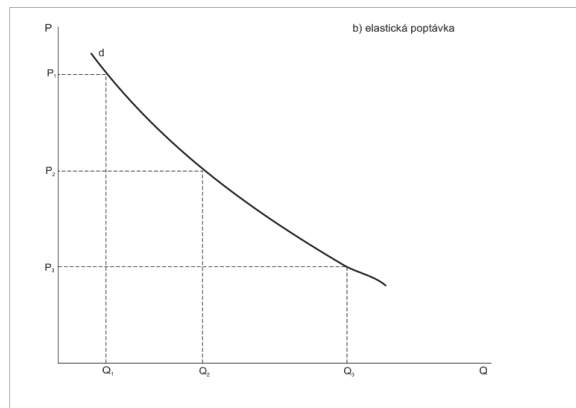
Graph n. 6 – Elastic demand curve

a) dokonale elastická poptávka

Graph n. 7 – Perfectly elastic demand curve

b) dokonale neelastická poptávka

Graph n. 8 – Perfectly nonelastic demand curve

Factors affecting elasticity of demand:

• **Character of needs** that are satisfied by goods. Elasticity of demand for goods that satisfy basic needs is lower than the elasticity of demand for luxury items.

• **The share of expenditure** on certain goods in consumer expenditure. The higher the percentage is, the higher is the elasticity.

• **The existence and availability of substitutes**. The more abundant and affordable substitutes are, the higher elasticity is.

• **Elasticity of demand changes in time** - with the extension of time the elasticity increases.

Variable and constant elasticity of demand

Price elasticity of demand may change in the course of the demand curve. Elasticity can be different with the varying volume of the demanded quantity.

Income and cross elasticity of demand

• **Income elasticity** - expresses the variation in demanded quantity to changes in consumers income.

$$\text{Income elasticity} = \frac{\% \text{ change in demanded quantity}}{\% \text{ change in income}}$$

If it is greater than 1 means that a certain percentage change in consumers income causes greater percentage change in demanded quantity of certain goods.

• **Cross elasticity** - shows how is changing the demanded quantity of a product, when we change the price of other goods.

$$\text{Cross elasticity} = \frac{\% \text{ change in demanded quantity}}{\% \text{ change in price of of other goods}}$$

Cross elasticity is positive in the case of substitutes, negative in the case of complements.

List of tasks for students:

1. Draw indifference curves for the following consumer situation (pair of goods) and explain:
   a) "I like beer, and I do not care what brand it is.
   b) "I do eat bread, but only with a butter Otherwise I do not eat bread at all.
   c) "If you give 3 or more cubes of sugar to the coffe it will be for me unacceptable.

2. Consumer spends on the purchase of goods X and Y together 200 monetary units. Utility function is defined as U = X * Y. Price the of good X is 10 - and the goods price Y is 4, -. What quantity of goods the will the consumer buy if he wants to maximize his benefit?

3. State always two kinds of goods whose demand manifests features:
   a) high income elasticity,
   b) low income elasticity,
   c) high price elasticity,
   d) low price elasticity.

4. Determine the marginal utility from the consumption of the tenth good X, if you know the total utility function: TU = 24X-X2.

5. Determine the marginal utility from the consumption of the third unit of the good X, if the total utility function is given by the equation: TU = 8X + 2X2.

6. We have the overall utility function of the form: 10X-X2. (X indicates the unit of goods consumed per week). Determine the equation of MU.
   a) At what level of consumption will fall TU?
   b) Derive and draw the curve MU and TU.
   c) The price of X is 6 CZK. At which consumption goods X will maximize household utility.

7. Student gets an allowance CZK 300 per week. He spneds his money on Kofola (X) and trdelník (Y). Price of trdelník is 50 CZK per piece and price of Kofola is 25 CZK per half liter.
   a) Write the equation of the budgetary constraints of the student.
   b) At steady state student drinks per week 5 liters Kofola. How much trdelník then buys?
   c) Calculate the MRS equilibrium market basket and draw graphically.

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