ECONOMICS

Chapter 1. THE UTILITY OF ECONOMIC GOODS AND THE OPTIMAL SELECTION OF THE CONSUMER

1.1. The assessment of the utility of economic goods

The measuring of the utility of commodity-goods has been a concern of the marginalist school since its emergence (in the second half of the 19th century), relying on a strong psychological component.

In this sense, in the economic science are known two ways of appreciation (commensuration) of the utility: *cardinal appreciation and ordinal appreciation*.

➢ ***The cardinalist approach*** is based on the theory of the cardinal utility developed by the founders of marginalism (S. Jevons, L. Walras, A. Marshall), who support the hypothesis of the existence of a consumer capable of ***quantifying***, in a number, the magnitude of the utility resulting from the consumption of a determined quantity of a good.

In essence, the marginalist school of thought regarding the cardinal appreciation of utility is based on the following ***postulates***:

a) the consumer *is able to precisely measure* the utility of each good (or unit of a good) consumed, in numerical expression, both as an individual utility and as a total utility;

b) the consumer *can compare* the utility levels generated by the consumption of a quantity of an economic good in relation to the consumption of a quantity of another economic good;

c) the same good may have *different utilities*, for two or more people (depending on the individual needs of each) or for the same person (depending on the quantity consumed and the circumstances in which it is used);

d) the hypothesis of *the progressive decline in utility*, when the human need is continually satisfied, until saturation, formulated for the first time by the German psychologist H. Gossen in 1854.

So, according to these postulates, can be described the following relations, so: if $X_1 = X_2 = X_3 = \dots X_i$, from a homogenous crowd "X" (representing identical goods or units, doses of a good), the utility of each consumed unit is different ($U_1 \neq U_2 \neq U_3 \neq \dots U_i$), respectively decreasing, meaning $U_1 > U_2 > U_3 > \dots U_i$.

The total utility is obtained by successively summing the individual utilities, specific to each unit consumed from a good, to fully satisfy the need. This is an increasing function in relation to the quantity consumed from that good (*single-purpose utility function*), although the increase is smaller and smaller, decreasing progressively.

$$U_t = \sum_{i \to 1}^{n} Ui \text{ and } U_t = U_t(X)$$

The supplementary (additional) utility received with each new unit consumed from an economic good is called ***the marginal utility*** (***Umg***). It is, in fact, the utility supplement resulting from the consumption of an additional unit (dose) of a homogeneous good and it is calculated as a ratio between the utility variation (ΔU) and the consumption increase of that product (ΔX); if the good is perfectly divisible, then the utility function will be continuous and derivable, and U_{mg} becomes derived from the utility function relative to the good X:

$$U_{mg}=\frac{\Delta U}{\Delta X} \text{ sau} U_{mg}=\frac{\partial U}{\partial X}$$

If $\Delta X = 1$, then $U_{mg}=\Delta U$, which shows how much the total utility for a consumer increases, when the quantity consumed increases with a unit (in fact, $U_{mg}=U_i$).

The marginal utility has a downward trend because it reduces the intensity of the needs, reaching zero when the individual need is fully met. At the same time, the total (cumulative) utility increases successively by increasing the consumption, but it increase with diminishing increases. In essence, the marginal utility represents the difference in utility made by a consumer, following the decision of consuming an extra unit of a certain economic good; it expresses the modification of the total utility, which corresponds to the change by one unit of the quantity consumed on the market of the analyzed good.

The tendency to decrease the marginal utility, in economic theory, is called ***the law of the diminishing marginal utility****, according to which, when the quantity consumed from a good or a lot of homogeneous goods increases, the marginal utility tends to diminish.*

The total utility reaches its maximum at the consumer's *satiety point*, when the *marginal utility becomes null* (U_{mg} = 0), which means that an increase in consumption with an additional unit no longer has the effect of increasing satisfaction. A rational consumer will not continue consumption beyond the satiety point, so marginal utility will always be diminishing and positive. Actually, on a graphical representation, the curve of the marginal utility of the consumer is, in fact, the curve of the diminishing demand for a normal good (Fig. no.1a, b).

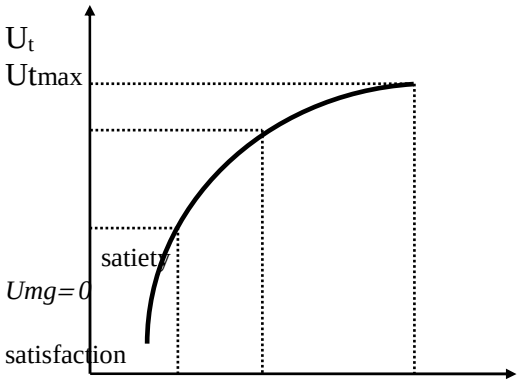

Fig.no.1a

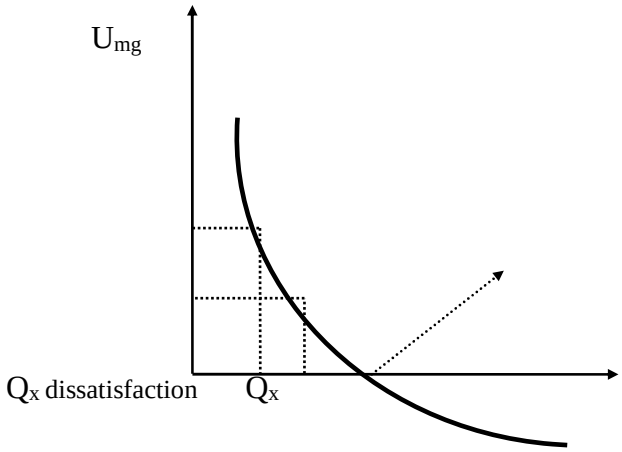

Fig.no.1b

In this respect, the law of diminishing marginal utility justifies the rational consumer behaviour, it respectively explains *the negative relationship between price and demand*. Thus, for example, as the price of a good (x) decreases, the marginal utility-price ratio increases, which, will determine in order to ensure the consumer's balance, the increase of the quantity bought and consumed, in order to reduce the marginal utility and to maintain constant, at the previous value of the Umg / Px ratio.

It is noted that in cardinal theory the good utility analysis is based on this new concept – marginal utility, which replaces the relatively equivalent notion of individual utility.

➢***Ordinalist approach*** was determined by the fact that the utility of a good cannot be judged isolated, independently of other goods held by the consumer, creating difficulties in building a rigorous cardinal scale of utility. In the real economy, it is hard to assume that each individual is equipped with the ability to precisely measure and represent the usefulness of all

existing goods on the market. Moreover, it is difficult, if not impossible, to find a unit of measure of utility, equivalent to all individual consumers, to quantify in an identical way the satisfactions experienced by them, following the consumption of different goods.

In essence, the ordinal appreciation (whose promoters were C. Menger and V. Pareto at the beginning of the 20th century) implies such an ***ordering*** of goods, which is in relation to the *preferences* or *tastes* of the consumer. The ordering of the preferences is imposed, particularly, by situations where available revenues do not allow full coverage of the needs. In this case, the rational consumer choices are made in the following ***hypotheses***:

a) the consumer *no longer has to measure the utility* of all the purchased goods, but it is sufficient to establish a *preference order* for them;

b) the numerous goods simultaneously consumed by an individual (X, Y, Z, etc.) *combine* and *substitute* each other to obtain the desired total utility (U).

The ordering of goods based on their hierarchy can be expressed by *the utility function*, which associates certain figures of the different quantities of consumed goods, and which will only indicate only the order of preference of each good. In this case, the consumer does not need a faithful measure of utility, but only to make a rational classification of his preferences.

If utility is a *function of two or more variables*, the total utility function will take the following form:

$$U_t = U_t(X, Y),$$

where X and Y are two perfectly divisible goods (that is, we have to do with an infinitesimal variation of the quantities consumed). In this case, ***the marginal utility*** of a good will be derived from the utility function in relation to the considered product:

$$U_{mg}x = \frac{\partial U}{\partial X} \quad \text{and} \quad U_{mg}y = \frac{\partial U}{\partial Y}$$

The marginal utilities of the two consumed goods are positive but diminishing. Through the two relationships is measured the variation of the total utility resulting from a change with a unit of the quantity consumed from the X good and Y, respectively.

A utility function reflects a way of assigning value to different consumer goods baskets, so the most desirable will get higher values than the least desirable. This means that the utility function will make a ranking of the goods.

In connection with the combination and substitution of the consumed goods, the simplest substitution can be made between the two desired goods X and Y. Thus, a rational consumer, who wants to maintain the same level of total utility and under a specific budgetary constraint, if he/she wants to increase the amount consumed from the good X to a certain extent, it will have to reduce the consumption of the good Y in another proportion.

Increasing the purchased quantity of a good "Y" to compensate for the total utility loss as a result of reducing the consumption by another unit from another good "X" expresses the content of ***the marginal consumption substitution rate (R_{msc})*** *between two goods, which is calculated according to the relationship:*

$$R_{msc} = -\frac{\Delta Y}{\Delta X} \quad or \; R_{msc} = \frac{dy}{dx}$$

The marginal substitution rate is the consumer's appropriate cost and measures the consumption variance of a Y good for the variance with a unit of a good X. In order to ensure the same total utility, it is necessary that the marginal utility of supplementing the consumption of the good Y be equal to the marginal utility lost by decreasing the consumption of the good X, meaning:

$$\Delta Y \times Umgy = \Delta X \times Umgx, R_{msc} = -\frac{\Delta Y}{\Delta X} = \frac{Umgx}{Umgy}$$

The marginal substitution rate is also expressed as the ratio between the marginal utility of the substituted good (X) and the marginal utility of the good (Y) with which the substitution is made.

Also, R_{msc} has *a decreasing trend over the length of the indifference curve*, as smaller quantities of the good Y are substituted by a unit of the good X (resulting in the convexity of the iso-utility curve).

Thus, we can rewrite the following equality relations:

$$R_{msc} = \frac{dy}{dx} = \frac{Umgx}{Umgy} = \frac{\frac{\partial U}{\partial x}}{\frac{\partial U}{\partial y}} = \frac{U'x}{U'y}$$

The combination of two products (X and Y) that substitute each other, so that the total utility remains constant is manifested as infinity of possibilities between two extreme points. The consumer is indifferent to what combination he makes between goods X and Y as soon as he gets the same aggregate utility (total).

The set of combinations of two goods (or categories of goods), which allow obtaining the same level of satisfaction (total utility) for the consumer, is known as ***indifference (iso-utility) curve***.

In other words, the total utility is not affected by the consumer's decision to choose another variant of combining, meaning to move from one point to another point on the indifference curve. An indifference curve is thus the reflection of equivalent *consumption programs* in terms of utility of goods. Also, the consumer can imagine a huge number of consumption possibilities, to which they correspond as many indifference curves. The set of indifference curves, which give expression to consuming (competing) consumer programs, form the *family (map) of indifference curves* (Figure 2).

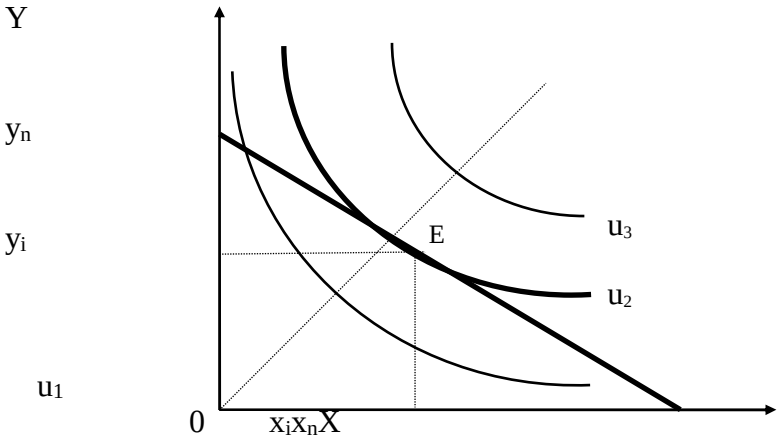

Fig. no. 2

The consumer does not change his/her utility when moving along any of these curves, but if it moves in the north-east direction from one curve to another, we notice that it increases the quantities consumed from both goods, reaching in this way increasing utility levels ($u_3 > u_2 > u_1$). So, the more an indifference curve is farther from home, the greater the consumer's preference for the combinations of goods that make up it.

1.2. The state of the consumer's optimum (balance)

The indifference curves illustrate *only* consumer preferences for two goods, specifying how they are willing to substitute different goods for each other, but they cannot show us what combination will be chosen. They also reflect the consumer's objective tendency to reach the farthest indifference curve, but it is not clear what curve will be reached. That is why we have to make a clear distinction between what a consumer *wants* and *what is possible* to achieve in order to integrate the constraints that influence his/her decisions.

In this context, the choices of a consumer are limited by the influence of two factors, with a decisive role on his/her behaviour, namely the *level of income* and *the prices of goods*, which are imposed as constraints at the time of the election. There is, thus, a *budgetary constraint* reflected by *the budget equation*:

$$B = X \times P_x + Y \times P_y ,$$

in which: B – the consumption budget (disposable income); P_x and P_y – the prices of goods X and Y. Thus, the budget constraint shows the set of goods combinations that the consumer can make, taking into account the available income and the existing prices.

On the previous graphical representation (fig. 2), this constraint is illustrated by *the budget line*, which has a negative slope ($-\frac{Px}{Py}$), since for the consumption of an additional unit of a good, a certain amount of the other good must be given up. The budget line can be drawn, being enough to know two extreme points (y_n and x_n). Thus, on the 0Y axis the maximum quantity of the good Y that the individual can obtain, if he/she consumes the quantity 0 of the good X, and on the 0X axis is determined the maximum quantity of the good X that can be obtained by consuming the quantity 0 of the good Y:

$$y_n = \frac{B}{Py}; \quad x_n = \frac{B}{Px} .$$

By joining the two points, a budget line is obtained, indicating a multitude of possible combinations, taking into account income and price levels. The budget line actually means *the line of maximum consumption possibilities* (the demarcation between accessible and impossible options). Each point of it represents a combination of the maximum quantities that can be purchased from goods X and Y under the use of available income for consumption.

Thus knowing this information about income and prices and assuming that the individual in question chooses the combination of two products that will bring him the most utility (meaning he will be on the highest indifference curve), can be determined *the optimal combination* of goods X and Y that he/she will achieve, respectively *the consumer's equilibrium point*. It is that combination of goods that gives the consumer the maximum benefit under a given budgetary constraint.

Indeed, looking at figure no. 2, it can be seen that not all variants on an indifference curve, which provide the maximum total utility, are on the budget line. At the same time, a number of variants on the budget line are under the indifference curve, which means that they do not provide the consumer with the maximum total utility.

The variant that ensures **the optimal structure and consumer balance** is given by *the point where the budget line is tangent to the indifference curve (point E)* and which corresponds to the quantities x_i and y_i of the two goods.

The consumption needs determine the consumer to determine the order of preference of the goods to be purchased, as well as how to combine and substitute them. Therefore, the individual's options for combining in different quantities the goods he wants to buy from the market in order to achieve a certain level of total (aggregated) satisfaction are called ***consumption programs***.

There are a lot of possible combinations of goods to be consumed by the buyer. The consumption programs that provide the same level of aggregate satisfaction (utility) are called *equivalent consumption programs*, which, on a graphical representation, are rendered through *the indifference curve*. But the consumption needs of each individual put him in the position of imagining other possibilities of combining the goods so as to increase their total utility. Therefore, the consumption programs that provide different levels of total satisfaction (utility) are called *concurrent consumption programs*, graphically rendered through the family (map) of indifference curves.

The optimal (rational) choice of the consumer differs depending on the situation of abundance or rarity of goods on the market.

▪ *In a situation of abundance of goods*, nothing limits the consumer's consumption opportunities. He/she does not bear any cost, he must not consent to any renunciation to obtain a certain amount of good. In this case (unfortunately in reality rarely met) the optimal option is to consume the good X up to the point where the total utility is at its maximum, meaning until the marginal utility becomes null. The consumer's equilibrium condition is therefore: $Umg_x = 0$.

▪ *In a rarity of goods situation, but with a savings economy (without the coin)*, the individual maximizes the satisfaction by choosing a combination (X, Y) so that the marginal utility of the two goods is equal. Indeed, if Umgx> Umgy, the consumer increases his total utility by substituting a unit of X with a unit of Y. He will continue this substitution as long as Umgx> Umgy. Marginal utility being a downward function of the amount consumed, Umgx gradually diminishes while Umgy increases and ultimately achieves a marginal utility equality point. The condition of the consumer's balance in this case is: *Umgx = Umgy*.

▪ *In a rarity of goods but with a monetary economy*, the goods do not change between themselves, but through the currency. The problem of the consumer is therefore to allocate a given budget between X and Y. It is no longer about knowing whether an additional unit of X or Y needs to be consumed, but whether it is necessary to spend an additional amount for good X or good Y. By analogy with the previous reasoning, it is understood that the consumer's optimum is reached when the marginal utility of a monetary unit spent on the good X is equal to the marginal utility of a monetary unit allocated for the good Y.

Thus, *the structure of the purchased goods is optimal when the marginal utility per unit of money spent (Umg/P) is the same for all purchased goods*, even if we assume that a consumer spends his entire budget for the purchase of only two goods X and Y, then *he/she is in balance*, when the relationship is fulfilled:

$$\frac{Umgx}{Px} = \frac{Umgy}{Py} \quad or \quad \frac{Umgx}{Umgy} = \frac{Px}{Py}$$

To maximize the total utility, the consumer buys a larger quantity of those goods that have a higher Umg/P ratio. But, according to the decreasing marginal utility law, as the quantity purchased in a good increases, the marginal utility decreases, and when the quantity decreases, the marginal utility increases. Starting from the fact that a consumer intends to acquire goods a, b, c in a determined period, *the total utility is maximal* when the consumer equalizes the marginal utility on the spent unit of money, that is:

$$\frac{Umga}{Pa} = \frac{Umgb}{Pb} = \frac{Umgc}{Pc}$$

Consumer's balance *or* ***optimum*** *designates that distribution of their budget for purchasing those quantities of goods and services that give him/her the highest satisfaction, taking into account their prices.*

From a mathematical point of view, the rational individual will make the optimal choice by solving the following system of equations:

$$max Ut(X, Y) \begin{cases} \frac{Umgx}{Umgy} = \frac{Px}{Py} \\ B = X \times P_x + Y \times P_y \end{cases} \Leftrightarrow \begin{cases} B = X \times P_x + Y \times P_y \end{cases}$$

Due to the mobility of the factors involved in its modification, the consumer's balance is *dynamic*. Thus, consumer's tastes, demands and requirements can be altered, the consumer's budget may increase or decrease, relative price levels may also change. The result of the combined action of these factors is either increasing the budgetary constraint on the consumer or weakening this constraint. Thus, new states of equilibrium are produced which may reflect a total utility superior to or inferior to the reference value.

In conclusion, the criterion of the economic and rational behaviour of the consumer is *utility*, respectively the maximization, by the consumption of the goods and services, obtained in exchange for the spending of the available budget. This behaviour is modelled by *the demand* for economic goods on the market.

Cap. 2. EFFICIENCY OF THE USE OF FACTORS OF PRODUCTION AND THE TYPOLOGY OF PRODUCTION COSTS

2.1. Productivity and its forms

In a productive activity, **the efficiency of using production factors** can be expressed in one of the following ways:

1. through the indicator called **the productivity (yield) of the production factors** used, which reflects the value of the output obtained per unit of used factors on the basis of the ratio:

$$W(R_f) = \frac{Q}{CF}$$

where: Q – the value of production (in physical or value units); CF - factor consumption (expressed physically or value).

In this calculation, enhancing the efficiency involves maximizing this ratio and is possible in the economy when the demand is expanding or the market has great potential so the company can increase supply.

2. through ***the profitability indicator of the activity***, which refers to the company's ability to achieve profit and is expressed through the *profit rate* calculated in different ways according to the interests of the economic analysis:

$$R_{pr/C}=\frac{P}{C}\times 100\ ;\ R_{pr/CA}=\frac{P}{CA}\times 100\ ;\ R_{pr/Cp}=\frac{P}{Cp}\times 100\ ;$$

- where: $R_{pr/C}$ – the rate of return on advanced capital; $R_{pr/CA}$ – the rate of return on income; $R_{pr/Cp}$ – the rate of profitability of consumed income; size of the profit (gross or net); C – used capital (fixed and circulating), CA – turnover; Cp - total cost of production (fixed costs and variable costs).

3. through the indicator ***specific consumption of production factors***, expressing the efforts (consumption of factors) that belong to a production unit or income.

$$C_{sf}=\frac{CF}{Q}$$

where: Q - the value of production (in physical or value units); CF - factor consumption (expressed physically or value).

Under this option, increasing economic efficiency involves *minimizing* the ratio and is possible when market demand for the product is no longer increasing, or when the supply of factors is very limited.

Productivity *is a measure of the efficiency that works in a production process* or, in other words, *the yield by which the factors of production are used in a productive activity*. Productivity, thus, establishes a quantitative link between the production achieved over a period of time and the inputs used during the same period.

In a general approach to economic theory, taking into account correlated sizes, the productivity of production factors has two ***fundamental forms***, namely: *partial productivity* and *global productivity*.

► ***Partial Productivity (W_{Fi})*** expresses the yield of a production factor (F_i) considered to be the origin of the production and its change, while the others remain constant.

Depending on the factor, the partial productivity is presented in the following classical forms: labour productivity *($W_L = Q/L$);* Soil productivity $W_P = Q/P$ *capital* productivity ($W_K = Q/K$)

The productivity of a production factor is its appropriation, resulting from its level of technical improvement, to contribute to the creation of a mass of goods and services, while maintaining a constant level of improvement of the other production factors.

► ***Global Productivity (W_G)*** expresses the aggregate efficiency of all the factors involved in producing a useful effect. This form of productivity, however, is difficult to assess because the aggregation methods of the production factors used (heterogeneous sizes) are not yet scientifically rigorous. From mathematical and economic point of view, it reflects the ratio between the total output produced and the total volume of factors used (in value expression):): $W_G = Q/(L+K+P)$. Both partial and global productivity can also be determined as *average productivity* and *marginal productivity*.

➢ ***Average productivity (W_m)*** is the measurable ratio between the total production volume (ΣQ) and either the total volume of a given factor (ΣF_i), being the total volume of all factors involved in an economic activity (L, K, P). Therefore, the pointer can be presented in two ways, respectively in a partial and global expression:

$$W_m=\frac{\Sigma Q}{\Sigma Fi}$$

$$W_m=\frac{\Sigma Q}{\Sigma L+\Sigma K+\Sigma P}$$

➢ ***The marginal productivity (W_{mg})*** expresses the supplement, the production increase (ΔQ), obtained with an additional unit of a certain factor (ΔF_i), the others remaining constant. If we consider an infinitesimal variation (in the vicinity of 0) of the factor "i", we can calculate the partial derivative of the function of the production in relation to the considered factor. It is also possible to calculate the production increase generated by the last units used by each factor, if we refer to the overall size. The relationships are as follows:

$$W_{mg}=\frac{\Delta Q}{\Delta Fi} \text{ sau } W_{mg}=\frac{\partial Q}{\partial Fi}$$

$$W_{mg}=\frac{\Delta Q}{\Delta L+\Delta K+\Delta P}$$

Specifically, the determination of the productivity level of the factors involved can be done using ***the classical method*** and ***the method of production functions***.

Using **the classical method**, productivity is determined by referring production indicators (Q) to production factors (L, K, P), resulting in the following ***productivity indicators***: *labour productivity* (social, average, marginal); *capital productivity* (average and marginal); *earth productivity* (average and marginal).

Work is the most important factor of any economic and social activity, and its fruitfulness is one of the basic forms of economic efficiency.

♦ ***Work productivity*** *(W_L) is defined as the efficiency with which a certain amount of work is spent*. Depending on the character of the work done, the manifestations of its productivity are: the productivity of social work, the productivity of individual work (average) and the productivity of marginal work.

◊ Social work productivity *(W_{VN})* expresses the efficiency of labour spending, the production of goods and services at the level of the national economy, or the yield with which labour is used, under average conditions of technical endowment, production organization, qualification and intensity.

It is determined as a ratio between the macroeconomic indicators (national income – NI, gross domestic product – GDP, gross national product – GNP, etc.) and the employed or active population (L), using the relations:

$$W=\frac{VN}{L} \; ; \; W=\frac{PIB}{L} \; ; \; W=\frac{PNB}{L}$$

It is not, therefore, determined as an average of individual productivity, taking into account gross value added (net) at national economy level and not national gross production.

◊ Average work productivity *(W_{Lm})* refers to the yield with which the human factor is used at the level of each economic agent, depending on the specific conditions of technical endowment, organization, qualification and intensity of work. It reflects the efficacy or fruitfulness with which a certain amount of work is spent. Increasing the productivity of individual work is basically the basis for increasing the productivity of social work.

This is measured by reporting the total production volume (ΣQ) to the workload (ΣL), as follows:

$$W_{Lm}=\frac{\Sigma Q}{\Sigma L} \text{ , în care:}$$

W_{Lm} – work productivity; Q – the quantity of goods and services obtained; L – the number of workers or the number of hours worked. Expression of production (Q) is made either in physical units (pieces, kg, tons etc.) or in units of value (lei, dollars, euros etc.) and the work expense (L) is expressed by number of employees or units (hours, days, months, years, etc.).

◊ *The marginal work productivity (W_{Lmg})* expresses the efficiency of the last work unit involved in economic activity and is determined as the ratio between the absolute variation of production (ΔQ) and the absolute variation in the work quantity (ΔL), as follows:

$$W_{Lmg} = \frac{\Delta Q}{\Delta L}$$

In other words, it is the additional production (ΔQ) that can be obtained under the conditions of using an additional unit of work factor (ΔL).

♦ ***Capital productivity*** *(W_K)* highlights the link between capital and outputs and reflects the yield with which productive technical capital is used. It is expressed, as in the case of the work factor, by the *average* productivity and *marginal* productivity indicators.

◊ *Average capital productivity (W_{Km})* is calculated as the ratio between the results obtained in a period of time (ΣQ) and the technical capital used (ΣK). The relation between the capital factor and the outputs can also be interpreted in the form of the average capital coefficient *(K_m),* which expresses the capital requirement for obtaining a production unit. We have the following two relationships:

$$W_{Km} = \frac{\Sigma Q}{\Sigma K} \; ; \; K_m = \frac{\Sigma K}{\Sigma Q}$$

◊ The marginal capital productivity (W_{Kmg}) expresses the efficiency of the last unit of the technical capital attracted and used in economic activity and is determined as the ratio between the absolute variation of production (ΔQ) and the absolute variation of the technical capital used (ΔK). Similarly to the above relationship, the marginal capital coefficient (K_{mg}) (is a ratio between the supplementary capital used(ΔK) and the afferent production increase (ΔQ),so:

$$W_{Kmg} = \frac{\Delta Q}{\Delta K} \; ; \; K_{mg} = \frac{\Delta K}{\Delta Q}$$

♦ ***Land (nature) productivity*** *(W_P)* expresses the efficiency of the natural production factor used in economic activity (arable, forest, pasture, orchards, etc.).

◊ *Average soil productivity (W_{Pm})* is calculated as the ratio between the obtained useful effect (ΣQ) and the area of land used (ΣP) or obtaining the useful effect (agricultural production) according to the relationship:

$$W_{Pm} = \frac{\Sigma Q}{\Sigma P}$$

◊ The marginal productivity of the land *(W_{Pmg})* expresses the yield of the last unit of land (m^2, ha) attracted to the economic activity and is determined as the ratio between the absolute change in production (ΔQ), expressed physically or in value, and the absolute variation of the land area (ΔP), according to the relationship:

$$W_{Pmg} = \frac{\Delta Q}{\Delta P}$$

Determining the factor productivity by the classical method, it is argued that a production created by the combined input of all factors of production relates, in turn, to each production factor, as if it were the result, which obviously does not correspond to reality. At the same time, contradictory developments in the productivity of some factors are possible in case of substitution. For example, by partially replacing work with production equipment at a higher technical level, the following situation may arise: work productivity increases, but fixed capital productivity (expressed in terms of price) decreases, which requires further analysis for the substitution decision of the factors.

To overcome these disadvantages (limits), one of the calculation methods used in modern economy is that of **the production functions**.

The production functions are the functionally expressed link between the output of a production activity (Q) and the factors that determine it (wage, labour, technical capital, etc.). The general form of the production function with "n" variables is

$$Q = f(x_1, x_2, x_3, \ldots x_n),$$

where $x_1, x_2, x_3, \ldots x_n$ are variable production factors. The production function shows all the possible combinations of factors and the product obtained.

In this case, it is estimated that the best link between the outputs and the production factors, in the conditions of partial substitutability between factors, is *the Coob-Douglas type function*, formulated by the economists C.W. Coob and P.H. Douglas, which presents itself as a relation of the type $Q = f(K, L)$. According to this, production depends on the size of the capital and the amount of labour used:

$$Q = A \times K^{\alpha} \times L^{\beta},$$

in which, Q – the calculated output expressed in value; K - the technical capital used; L - the labour used in terms of number of employees; A - the proportionality coefficient between labour and capital; α - the elasticity of production versus capital; β - the coefficient of elasticity of production relative to labour. So: A, α, β are positive parameters that influence factors in their specific way.

Based on the Cobb-Douglas production function, the following indicators can be calculated with relevance in the microeconomic analysis:

1. Average productivity(average yield - R):

$$R_L = \frac{Q}{L} = \frac{A \times K^{\alpha} \times L^{\beta}}{L} = A \times K^{\alpha} \times L^{\beta-1}$$

$$R_K = \frac{Q}{K} = \frac{A \times K^{\alpha} \times L^{\beta}}{K} = A \times K^{\alpha-1} \times L^{\beta}$$

2. Marginal productivity (marginal or differential yield- R_D):

$$R_{DL} = \frac{\partial Q}{\partial L} = \beta A \times K^{\alpha} \times L^{\beta-1} = \beta R_L$$

$$R_{DK} = \frac{\partial Q}{\partial K} = \alpha A \times K^{\alpha-1} \times L^{\beta} = \alpha R_K$$

3. The elasticity of production in relation to the factors that determine it (E_L , E_K):

$$E_L = \frac{\partial Q}{\partial L} : \frac{Q}{L} = \beta R_L \ : R_L = \beta$$

$$E_K = \frac{\partial Q}{\partial K} : \frac{Q}{K} = \alpha R_K \ : R_K = \alpha$$

2.2. Classification of the production costs

According to a broad definition[1] of economic literature, ***the cost of production*** is *the monetary (value) expression of the consumption of inputs, to obtain a good or service, or, in other words, represents the total consumption of inputs, in view of production and sale of economic goods.*

The value expression of all these costs allows us to measure and compare the consumption of all the inputs used, regardless of their nature. Also, expenditures on used and consumed inputs must be included in the sale price of goods and services so that they can be recovered and thus the economic activity continued.

The inclusion of these costs in the sale price of the economic asset is made through the cost of production and it is in fact the "effort" value that the firm makes to produce and bring to market a certain good or service.

In modern microeconomic theory there are *two concepts (modes)* of assessing production costs at the level of an economic agent, namely: accounting conception and economic conception.

According to **accounting** thinking, the cost of production is equivalent to the concept of *accounting cost (explicit cost).* Indeed, when assessing the company's cost of production, the accountant only takes into account all the costs the entrepreneur undertakes to acquire the necessary business and tax-related factors. They make up the explicit cost over a certain period of time and are highlighted through specific documents and invoices paid by the firm. Specifically, this type of cost includes the following expense categories: salary and other personnel payments; expenditure on raw materials, materials, energy and fuel; expenses with amortisements; expenses for the payment of telephone services, rent, etc.; expenditure on taxes and duties, etc.

The difference between total revenue (turnover) and total explicit cost (accounting) is the company's *gross profit*. From this, if the tax on the profit calculated according to the regulated tax procedures is deducted, results the *net accounting profit*, which remains at the disposal of the company.

According to the **economic** concept, the cost of production is much more comprehensive, including in its structure both the explicit costs and the costs called *implicit* or "imputable" to the production.

In general, explicit costs refer to those expenses incurred by third parties, largely corresponding to the payment of factors purchased externally. But firms can also use their own factors, which they do not buy from other economic agents because they own them. The production costs that would be incurred if the company's own resources were purchased on a costly basis are *implicit costs*.

Implicit costs, therefore, reflect the consumption of the factors that the firm owns, such as: land, buildings, equity, the work of organizing and managing the business, etc.

In this case, the cost of production (economic) is higher than the accounting cost, including in its structure and what constitutes the *normal profit*, as a reward for the consumption of factors of production of the owner – entrepreneur, not recorded in the accounting cost.

The implicit cost thus means *the opportunity cost of the production* factors owned by the entrepreneur (the firm), that is the sum of all the revenues that could be obtained by him from the factors owned, in the best use, which he gave up. As such, this revenue must be in the so-called *normal profit*, equivalent to the *implicit cost* notion.

The implicit cost is only relevant for determining *the economic profit* as the difference between the total revenue received and the total cost of production (the sum of the explicit

[1] Niţă Dobrotă, *Economie politică*, Editura Economică, Bucureşti, 1997.

cost and implicit cost). In this case, the economic profit (Pe) appears to us as part of the accounting profit (Pc), the rest being the normal profit (Pn):

$$Pc = Pn + Pe\ .$$

Cost typology (structure) highlights their role and economic significance, from different angles of view of economic analysis and behaviour of economic agents

The most general **cost typology** expresses their classification by three groups of *criteria:*

I. *According to the relationship between the evolution of the different costs and the change in production*, the cost of production is divided into the following:

a) ***fixed costs*** category (CF), which includes those production costs which, in the short run, do not depend on the volume of production, remaining relatively constant, irrespective of the change in production, such as: fixed capital depreciation, rent, general lighting and heating of the units, interest, salaries of administrative staff, etc. If Q=0, CF>0.

b) ***variable cost*** category (CV), which includes those production costs that, in the short run, evolve in the same way as production change, such as: raw materials and materials, fuels, energy for production, salaries of the productive staff, etc. If Q =0, CV =0.

c) ***total cost*** category (CT), which includes the sum of fixed and variable costs, meaning :$CT = CF + CV$.

II. *According to the way of reporting the production costs (total, fixed or variable) to the obtained output*, the following ***average (unitary) costs*** are obtained:

a) ***the average fixed cost*** (CMF) is the fixed cost per unit of product or service and is calculated by reporting the total fixed costs to the output obtained (Q), meaning:

$$CMF = \frac{\Sigma CF}{\Sigma Q}$$

b) ***the average variable cost*** (CMV) is calculated by reporting the total variable costs to the output obtained and expresses the variable cost per production unit as follows:

$$CMV = \frac{\Sigma CV}{\Sigma Q}$$

c) ***the total average cost*** (CMT) is determined as the ratio between the total cost of production and the volume of production or the sum of the average cost and the variable average cost as follows:

$$CMT = \frac{\Sigma CT}{\Sigma Q} \quad \text{sau}$$

$$CMT = CMF + CMV$$

III. *The interdependence between the increase in production and the increase in the total cost of production* is reflected by ***the marginal cost*** (Cmg). This is defined as the total expenditure increase driven by the increase by one unit of the production volume (ΔQ), and if we take into account infinitely small production increase the marginal cost appears as a derivative of the total function cost:

$$C_{mg} = \frac{\Delta CT}{\Delta Q} \quad \text{sau} \quad C_{mg} = \frac{\partial CT}{\partial Q}$$

Determining the marginal cost plays a decisive role in establishing the optimal variants of future production so that the increase in production is achieved with the least effort. For this purpose, the marginal cost size may be higher, equal to or less than the average cost (unitary). The marginal cost is of particular importance in making decisions about increasing the production of goods. Following the increase in profits, the economic agents will be stimulated to carry out additional production only if the marginal cost is lower than the average cost (unit), as follows: Cmg <CM.

Chapter 3. CONSUMPTION, SAVINGS AND INVESTMENTS AT THE MACROECONOMIC LEVEL

3.1. Consumption and savings

Consumption is the share of the income spent on the purchase of goods and services, intended to directly meet the needs of the population and / or the general needs of society.

Consumption at the macroeconomic level needs to be analyzed under its two ***forms***: *final consumption* and *intermediate consumption.*

1. The final consumption represents the overall expenditures that allow the direct meeting of human, individual and collective needs. These are costs that do not directly contribute to an increase of production. The final consumption size (final production) is worked out as the difference between the value of all the goods and services derived from domestic and imported products on the one hand, and the value of the intermediate consumption, investment and export goods on the other hand.

The final consumption is divided in its turn into two categories: *private consumption* and *public consumption*.

a. *Private consumption* includes, according to the international statistical practice, all material goods and services purchased by the population (private households), including those from its own production, in order to meet their needs. Consumption includes: purchases of durable and current consumer goods (except real estate and land) on the market; the purchase of services (transport, telecommunications, post, etc.); purchases of agri-food products etc.

b. *Public consumption* comprises consumption in the central and local state administration institutions for the provision of public services. In other words, public (state) consumption includes those expenditures for the provision of social-administrative services, which are made available to the community without a special payment. This consumption can be quantified by adding up the expenditure on goods consumed or purchased for the provision of public services (state intermediate consumption), fixed capital amortization, salaries of public sector employees.

2. Intermediate consumption (intermediate production) is the value of economic goods from previous production processes which are used and consumed in other production processes for the purpose of creating new goods and services. This consumption includes: expenditure on raw and other type of materials, subassemblies, energy, fuels, current repairs, spare parts, etc.

In its evolution, consumption is subject to the influence of certain categories of ***determinant factors***.

In the following, we will analyze their influence on final consumption, since the intermediate consumption is deduced, as is known, from the calculation of the national income.

The factor that plays the most important role in the evolution of consumption at the macroeconomic level is the ***national disposable income (NDI)***, that is the national income (NI) corrected with the balance of receipts and payments in relation to foreign currency (the balance of current transfers with foreign countries - BCTFC) : NDI = NI + BCTFC.

The correlations between the income and consumption expenditure were analyzed in economic theory and synthesized in the so-called ***consumption regularities***.

Among them, the "***fundamental psychological law***", formulated by the English economist J.M. Keynes, has become the most important; according to it, "when there is a rise

or fall in income, people, usually and on average, tend to increase or decrease their consumption, but to a lesser extent ".

In other words, the variation in consumption ΔC has the same sign as that of the income ΔV, but in a smaller proportion, that is ΔV > ΔC, while the ratio $\frac{\Delta C}{\Delta V}$ is dynamically positive and subunitary.

The ***functional relationship between income and consumption*** is expressed by the ***propensities to consumption***, namely: the *mean propensity* and *marginal propensity*. They express the tendency of individuals to spend part of their income for the procurement of consumer goods (satisfactors).

The mean propensity to consumption (c) is the ratio between total consumption and disposable income, ie:

$$c = \frac{C}{V}$$

It shows how much of an income monetary unit is spent on consumption. If this ratio is expressed per cent, it represents the *consumption rate*, that is the share of the total consumption in disposable income:

$$c = \frac{C}{V} \times 100$$

The marginal propensity to consumption (c') is calculated as the ratio between the consumption variation (ΔC) and the corresponding variation of the income (ΔV), according to the following:

$$c' = \frac{\Delta C}{\Delta V}$$

It expresses the increase (decrease) of consumption in relation to a unitary increase (decrease) in income. In other words, it is the additional consumption made by a person (household) when receiving an additional income monetary unit. As stated, according to the fundamental psychological law, (*c'*) is usually presented as positive, but subunitary, that is: $0 < c' < 1$. It should be pointed out that the marginal propensity to consumption can reach, at least in theory, the value 0, when ΔC = 0 (consumption remains constant in relation to the income variation), and the value 1, when ΔC = ΔV (consumption varies proportionally with income), that is: $0 \leq c' \leq 1$.

Another determinant factor of consumption is ***wealth***, which is the value of all tangible and intangible assets owned by family households and / or public administrations. Wealth is a quantity of *stock* that can be calculated at a given moment, as opposed to income that is a *flow* over a period of time. However, there is a close relationship between the two economic variables, since goods that make up wealth usually meet the characteristics of economic goods, so they have a market economy value.

As such, these assets have the ability to generate an income flow in the future for their owners. Thus, we can say that a stock of physical and financial assets owned by an individual (family household) is a potential generator of income flows, while changes in the volume and structure of assets influence the income flow and implicitly the consumption expenditures. The fact that bigger wealth can lead to higher consumption is called the *wealth effect*.

Consumption is also influenced by ***expectations*** or ***forecasts*** of future income, prices and wealth. However, they have a different impact on consumption, whether they are income or wealth expectations, or price expectations.

Thus, if individuals expect the *general price level* to rise (pessimistic expectations) in the near future, they will be quite motivated to increase their current consumption

expenditures. Conversely, a prospect of falling prices (optimistic expectations) will result in a reduction in current consumer spending or, better said, its delay for an immediately subsequent period.

Pessimistic forecasts, in terms of *income* or *wealth* (for example, unemployment prospects for an employed person) may cause households to reduce certain consumption expenditures (but keep their consumption to a vital minimum) and save more. When forecasts are optimistic (for example, expecting to be promoted to a secure and better paid position), current consumption has a tendency to increase, to the detriment of savings and, in particular, due to the loans to be reimbursed later.

Since income (V) aims to meet both present and future needs, it is divided into a certain proportion in consumption expenditures (E) and savings (S). Therefore, the surplus of income over consumption expenditures is represented by **savings**, hence:

$$V = E + S$$

A distinction needs to be made between the saving concepts and savings. Thus, while *saving* is a process that takes place over a period of time, representing an accumulated income flow, *savings* consist of income accumulated at the end of a period of time and represent a stock of value, in other words, they are a result of saving.

The volume of savings at the macroeconomic level is the result of the general behavior of both individuals and economic agents operating in a national economy.

Similarly to consumption, the savings obviously depend on the objective and primordial factor - the ***available/disposable income***.

With this meaning, the proportion between savings and income or the propensity to saving is expressed - as in the case of consumption - by the following concepts: *mean propensity* and *marginal propensity*.

⇗ ***Mean propensity to savings (s)*** expresses the ratio between the volume of savings (S) and the disposable income (V),

$$s = \frac{S}{V}$$

If the ratio is calculated as a percentage, we can talk about the *savings rate*, calculated as follows:

$$s = \frac{S}{V} \times 100$$

It shows the share of savings in total disposable income. The mean propensity to savings shows us how much is saved from an available monetary unit at a certain point in time.

⇗ ***Marginal propensity to savings (e')*** is the ratio between the savings variation (ΔS) and the income variation (ΔV), thus

$$e' = \frac{\Delta S}{\Delta V}$$

This shows us how many units the savings vary by when there is a variation of one unit of income or, in other words, it expresses the gain (reduction) in savings due to the increase (decrease) of the income by one unit.

Given the psychological characteristics of the human beings, their customs and traditions, Keynes analyzed a particular category of factors, of a subjective nature, that can influence savings and, implicitly, consumption. He has included in this category some

reasons (motives) that cause individuals and families to lower consumer spending in favor of increasing savings, such as:

- people's desire to create a contingency reserve;
- the desire to be able to benefit from interest and value gains;
- the feeling of independence, safety and freedom;
- the desire to have a current liquidity amount to implement some speculative or commercial projects;
- the intention to leave a considerable fortune to their heirs;
- stinginess, as a component of human nature, and so on.

It should be noted that *national savings (Sn)* are divided into three different categories: *personal savings (SP),* which are formed on the basis of available household income; *company's gross savings (SBE),* equal to depreciation (amortization) plus unallocated income; *the government surplus (SG),* which is the amount left after the public expenditures, out of the total public financial resources mobilized for the state. Therefore:

$$Sn = SP + SBE + SG$$

Savings, in essence, have a progressive role in society through *their ability to be turned into investments*. Indeed, in the long run, *the formation of a country's capital is determined by the national saving rate*. If a country saves much, it increases investment opportunities, with the economy benefiting from a sharp increase in potential production. If a country's savings rate is low, equipment and production facilities become obsolete and the infrastructure begins to deteriorate.

Thus, if V = E + S, it follows that $\Delta V = \Delta E + \Delta S$, which means that the sum of the propensities to consumption and savings, mean and marginal, is equal to the unit; therefore:

$$c + e = 1 \quad \text{şi} \quad c' + e' = 1$$

A comparative analysis of statistical data at national level highlights the following ***conclusions (correlations)*** regarding the consumption and savings dynamics, in relation to the disposable income:

- both consumption and savings increase at the same time as income increases, but in varying proportions; consumption growth is decreasing and savings growth is rising;
- both the mean propensity (c) and the marginal propensity to consumption (c ') have a *downward* dynamics, in relation to the income increase, that is the additional consumption tends to decrease as a result of the income growth by one unit; in the beginning there is a large marginal propensity, close to the value 1 ($\Delta C \leq \Delta V$) and in the end there is a small marginal propensity, which will gradually approach the value 0 as the income increases ($\Delta E < \Delta V$); in any case, in the dynamics, we have the following: $0 < c' < 1$;
- symmetrically, both the mean propensity (e) and the marginal propensity to savings (e ') have an *upward* trend as compared to the income growth, that is the extra savings made as a result of income growth by one unit tend to increase; in the beginning there is a small marginal propensity close to the value 0 ($\Delta S < \Delta V$) and in the end there is a large marginal propensity, which will gradually approach the value 1 if the income will increase continuously ($\Delta S \leq \Delta V$); similarly, we have the following: $0 < e' < 1$;

- if we know these two evolutions, of the propensities to consumption and savings, we can conclude that up to a certain point (when c' ≈ e'), $\Delta E > \Delta S$, and beyond this point, $\Delta S > \Delta E$;
- The marginal propensity to consumption and the marginal propensity to savings are complementary notions; just as income is destined for consumption and savings, each additional income monetary unit must be divided between additional consumption and additional savings;

3.2. Investments; multiplier and accelerator

Necessarily, *at the macroeconomic level, savings appear to be a prerequisite for* **investments**, so that all national savings are nothing but potential investments. We can say that savings and investments in a country are, in fact, different facets of the same process; therefore, they can be considered to be of equal sizes: I = S.

Depending on the destination of purchased capital goods, two major categories of investments can be distinguished:

a) replacement investments intended to replace fixed capital goods which have been decommissioned as a result of their depreciation and which allow the fixed capital stock to be maintained. Their source of financing is amortization.

b) net (development) investments, intended to increase the volume of real (technical) capital, that is to increase the volume of fixed capital and material stocks. These investments ensure the increase of productive capacities and represent the *net formation of capital*. The source of their funding is the saved income.

The sum of the *replacement investments (Ii)* and *net investments (In)* forms the ***gross investment (Ib)***, which contribute to the *gross capital formation.*

$$Ii + In = Ib; \quad Ib = In + A$$

It should be noted that this equality between savings and investments is checked when we consider investments in the broad sense (presented above), that is we also consider the possibility of placing a part of the unused and saved income on the capital market. Otherwise, the relationship of equality can become a relation of relative inequality: I ≤ S.

While *savings express the collective behavior of the individual consumer, the investments reflect the collective behavior of the individual entrepreneur*.

The correlations that are formed during the economic space and time between investments, income, consumption, savings, income again, consumption and so on were analyzed in the macroeconomics theory under the names of: the *multiplier principle* and the *accelerator principle.*

❖ ***The multiplier principle***[2] expresses the *causal relationship between investment growth and income growth, in the form of an amplification coefficient (K), which shows the magnitude of the income growth as a result of the growth of an investment by one unit*, as follows:

$$K = \frac{\Delta V}{\Delta I}$$

[2] The concept of *multiplier* was introduced for the first time in the economic theory by R. F. Kahn in 1931. Subsequently, J. M. Keynes generalized the use of the multiplier in the interaction between investment and income.

It highlights the effect of income multiplication on investment, so that increasing investments affect the income growth K times, so:

$$\Delta V = K \times \Delta I \text{ , and } K > 1$$

As we know, at the macroeconomic level, $S = I$, which means that $\Delta S = \Delta I$, thus: $\Delta I = \Delta V - \Delta E$. The multiplier relation thus becomes the following

$$K = \frac{\Delta V}{\Delta V - \Delta E} \quad sau \quad K = \frac{1}{1 - \frac{\Delta E}{\Delta V}}$$

If we take into account that the ratio $\frac{\Delta E}{\Delta V}$ represents the *marginal propensity to consumption (c')*, then:

$$K = \frac{1}{1 - c'} \qquad (1)$$

But *(1-c')* represents the *marginal propensity to savings (e')*, thus *1-c'=e'* and, as such, the multiplier will be of the form:

$$K = \frac{1}{e'} \qquad (2)$$

According to the relations (1) and (2) of the multiplier, *its value is higher as the marginal propensity to consumption is higher, or the marginal propensity to savings is lower.*

Starting from the relation $\Delta V = K \times \Delta I$, we will have the interdependence relations (a) and (b):

$$\Delta V = \frac{1}{1 - c'} \times \Delta I \qquad (a)$$

$$\Delta V = \frac{1}{e'} \times \Delta I \qquad (b)$$

❖ ***The accelerator principle***[3] *expresses the causal relationship between income growth and investment growth. According to this principle, an increase in demand for consumer goods, as a result of higher incomes, will lead to a more than proportional increase in the production of capital goods (investment).*

In other words, *the accelerator principle expresses the effect of income growth on investment, under the stimulus of increasing consumer demand*. It highlights the relationship between the demand for consumer goods and the capital goods.

The logic of this principle can be presented as follows: an increase in income (Δ V) generates an increase in demand for consumer goods (Δ C); consumer goods manufacturers seek to adjust their offer (production) to the changing demand (Δ Q); to increase production, an additional investment in capital goods (Δ I) is required, increasing the demand for such goods and implicitly the production of these goods.

The accelerator (a) is expressed using the following:

$$a = \frac{\Delta I}{\Delta V} = \frac{I_1 - I_0}{V_1 - V_0}, \Rightarrow \Delta I = a \times \Delta V$$

[3] The principle of *acceleration* was first formulated by A. Aftalion (1909) and developed by the American economist J. B. Clark (1917). Kuznetz, R. F. Harrod and P. A. Samuelson have also been involved in researching the accelerator.

If the base year investment (I_0) was null, the accelerator formula becomes:

$$a = \frac{I_1}{V_1 - V_0} = \frac{I_1}{\Delta V} \quad \text{şi} \quad a > 1$$

According to the above, the accelerator is a measurement that shows how much the investments increase by as a result of the income growth by one unit (the income, which, as we have said, underlies an increase in consumer demand). Thus, if all the production capacities are used, a change in the demand for consumer goods generates a change in the investment of a higher amplitude.

Chapter 4. INFLATION: CONCEPT, FORMS, MEASUREMENT

4.1. Causal forms of inflation

Contemporaneous inflation *represents a monetary-material macroeconomic imbalance that expresses the existence of a monetary mass that exceeds the real needs of the economy (circulation), which leads to the depreciation of money and to the sustainable and generalized increase of the prices of goods and services in an economy.*

The inflation mechanism is directly linked to the main causes of this phenomenon. In this regard, the correlations between aggregate demand, aggregate supply and price level need to be analyzed.

Knowing that in a functioning market economy the average level of the macroeconomic prices is determined by the *aggregate demand (CA)* and *aggregate supply (OA)* interaction, and that the meeting point of the two macroeconomic categories will determine the *equilibrium price (PE)*, then this price will fluctuate according to the variations in global supply and demand. On a graphical representation, the intersection of the curves representing aggregate demand and supply will indicate the level of the equilibrium price.

Understanding the mechanism of interaction between these two macroeconomic variables allows us to deduce the underlying causes of inflation.

In this respect, two major ***causal forms*** of contemporary inflation can be identified: *demand-pull inflation* and *cost-push inflation*.

* **Demand-pull inflation**

This type of inflation appears as a result of the *aggregate demand growth* over a period of time, at a higher pace than the aggregate supply. In other words, the excess of solvable demand corresponds to a rigid offer that cannot be adapted to the requirements of the demand.

Production companies will have two types of reactions to such an evolution of demand: predominantly *increase production* or, predominantly *increase prices*.

If there are underutilized production capacities in the economy and unemployment is relatively high, then aggregate demand growth can directly lead to an increase in production (aggregate supply) at a higher rate than the general price increase, that is we are in the context of an elastic offer that can ensure the balance of the goods market. It is the moment when the economy can be relaunched, and unemployment decreases. For this reason, there are economists who promote the concept of "inflation policy", recommending it to the political factors as a remedy to the exit the crisis and to increase employment.

The more inelastic the supply (production), meaning that there are no underutilized production capacities in the economy and unemployment is low, the more companies will respond to the increase in demand, especially through increases in price, thus generating an inflationary surge. In this situation, recommending the "inflation policy" is unsuitable and inappropriate.

Generally, such inflation is specific to periods of upsurge or economic boom, when opportunities to increase production are limited, and an increase in demand corresponds to an almost proportional increase in prices.

Given the structure of aggregate demand, its growth needs to be analyzed starting from the elements that make it up. As such, it can result from the following circumstances:

- ✓ increase in consumer spending by the population;
- ✓ increased investment by companies, resulting in delayed productive effects;

- ✓ excessive increase in public spending, ie government purchases, especially non-productive ones;
- ✓ increase in exports, ie the entry of additional foreign currencies in bank accounts.

Overall, excess demand on the market may have the following, more important, ***causes***: ♦ *excessive issuance of currency in circulation*, which generates *currency inflation*; ♦ *the expansion of bank credits*, which leads to *credit inflation*; ♦ *decrease of the propensity to saving*, which results in *inflation by dissaving*.

➢ ***Currency inflation*** is determined by the introduction and maintenance of an excess monetary mass in relation to the volume of commodities on the market above the needs of money circulation. This is generally the case when large budget deficits occur and their financing is done through loans from the central bank, which will issue a corresponding amount of money. The inflation phenomenon comes from the fact that the state does not borrow to produce additional goods and services, but to consume, triggering a demand without a correspondent in the offer.

Furthermore, when there is a massive surplus of exports as compared to imports, the currency reserves of the country rise, which balance new cash issuance, that do not find a corresponding market equivalent in goods and services.

Supplementing the money in circulation can also compete with the decrease in the rate of money rotation, while maintaining the physical and value-wise volume of transactions.

➢ ***Credit inflation*** is a result of the exaggerated development of bank credit, which can lead to an oversize of the volume of account money with inflation effects similar to those produced by cash. This form of inflation occurs when credit expansion is used for massive investments in the economy, and these investments, which are not carried out and are not operational, in time will lead to a further activation of consumer demand (as there is an extra monetary mass in circulation). This consumer demand corresponds to an offer that is "late" to appear, resulting in higher prices for most consumer goods. Similarly, the substantial increase in consumer credit will lead to the same result.

Credit inflation and currency inflation can be considered as one and the same form of inflation (monetary inflation), and have as common ground the direct or indirect increase of the nominal incomes of the population and economic agents; these incomes underlie the potential surplus of demand.

➢ ***Inflation by dissaving*** originates in lowering the tendency for savings from the population as a result of pessimistic forecasts regarding the preservation of the purchasing power of existing and future economies, as well as of factors of a subjective and psychological nature for a certain period of time. The result of this behavior is the increase of the ratio of consumption in the total disposable incomes of the population; this consumption tends to exceed the supply of goods (especially for long-term use) and will generate a price increase in the production branches.

* **Cost-push inflation**

Cost-push inflation occurs when the overall production costs rise at a steady pace, regardless of the aggregate demand.

If the economic agents involved in production are faced with a cost increase, they will partly respond by increasing the *selling prices* and partly by *reducing the volume of activity*.

The extent to which economic agents will increase prices and reduce production depends on the evolution of the aggregate demand.

If the aggregate demand is more inelastic, the production will be reduced to a lesser degree, with the higher cost burden being passed on to consumers through higher prices, thus marking the beginning of cost-push inflation.

However, if aggregate demand is relatively elastic in relation to price developments, production companies will have to decrease production (to avoid compromising their profitability), with negative consequences for employment in the respective branches.

It is therefore noticed that a generalized increase in production costs will cause negative conditions for the economy in both cases of demand evolution: either the rise of the inflation phenomenon or the rise in unemployment.

In estimating cost-push inflation, we have to mention the different effect the cost change has on it. A single increase in costs (caused, for example, by the government's increase in gasoline excise duties) will generate a single rise in the price of goods (in our case gasoline, as well as other commodities produced and marketed using this fuel). Once this growth wave has spread, prices will stabilize at this new level, with inflation returning to zero (it has been limited in time). If, however, we have a successive increase in costs from one period of time to the next, and in the case of an inelastic demand, the inflation phenomenon will become permanent, being much more difficult to counteract. Similarly, if demand is elastic, production will begin to gradually decline, with effects on the persisting unemployment in both the respective branch and others.

Moreover, the elasticity of global demand, that is its evolution according to the general price level, needs to be considered as a result of the evolution of individual market demands for all the goods and services offered in an economy at existing prices.

It can be noted that, in the case of demand-pull inflation, in the context of cost-push inflation, the effect on production and employment is the opposite. If demand-pull inflation can lead to inflationary economic growth, which is permissible for a high level of employment, cost-push inflation generally leads to a fall in production and a reduction in the number of jobs.

There are many factors that can increase costs and become a ***cause*** of cost-push inflation. Among the most important, there are:

- *increasing wages at a higher pace than that of increasing labor productivity*. The pressure of high production costs is reflected in inflationary prices when the remuneration of production factors (especially the labor factor) increases to a higher extent than that of their productivity. A wage policy that is not founded on economic criteria will lead to high wages without coverage in production, and results in inflationary tensions. Wage claims and increases do not lead to inflationary prices only when the dynamics of wages is at most equal to the labor productivity dynamics.
- *excessive profit growth*. The phenomenon typically appears in the case of large, monopolistic or oligopolistic companies that impose high prices on the products they sell; these prices may represent acquisition costs for other economic agents.
- *increasing prices for raw and other type of materials*. This phenomenon usually refers to raw materials, fuels, energy, etc., which are imported and whose prices are reflected in the production costs of indigenous finished products (imported inflation). The inflationary effect is amplified against the devaluation of the national currency, which means more expensive imports and cheaper exports.
- *the accelerated amortization policy*. The practice of decreasing amortization during the normal operation of fixed assets, in order to prevent premature obsolescence, leads to higher costs being recorded when fixed assets begin to be used.

- *high fiscal pressure*. If direct taxes reduce the disposable nominal income and consequently inflationary demand pressure, the same is not the case with indirect taxes, which are found in the product selling prices.

The distinction between cost-push inflation and demand-pull inflation is difficult to observe in the real economy as they manifest simultaneously.

Some economists even argue that, in reality, inflation cannot be attributed solely to demand or costs, but it is the result of the combined action of these two trigger factors, thus talking about **mixed (combined) inflation**. Both types of inflation ultimately manifest themselves as a single phenomenon, namely the generalized increase in prices. In fact, there is a part-whole relationship between the level of production costs and the level of income, these being two economic categories reflected by the same reality - the price. Thus, the two types of inflation become intertwined, even if the phenomenon was originally triggered by a single factor. The combination of the two types of inflation may result in an *inflationary spiral* that would be difficult to stop:

The price-wage inflationary spiral

Populist economic policy → increase of wages → increase of costs → increase of selling prices → decrease of the purchasing power of wages → social demands → new increases of wages → a new increase of costs → a new inflationary surge

4.2. Measuring inflation

The ***magnitude*** of inflation is usually expressed in a relative way, by calculating certain *index* categories, based on which the scale of the inflation phenomenon in a country can be measured.

In the European Union countries, the *Laspeyres price index (IP)* is used to measure inflation, a synthetic (aggregate)index, calculated according to the following formula:

$$IP = \frac{\sum Q_0 P_1}{\sum Q_0 P_0} \times 100 ,$$

where: Q_0 - the quantity of economic commodities in the base period T_0, while P_1 and P_0 - the average prices of the goods categories taken into account during the base period and the current period.

Depending on the nature of the goods making up the sample, the price index may be either in the form of the *consumer price index (IPC)*, which is determined on the basis of a "basket" of consumer goods (goods and services) relevant to the consumption of the population, or the *general price index (IGP)*, which takes into account both consumer goods prices and capital goods prices.

In Romania, the IPC is calculated on the basis of a product list, comprising over 1700 assortments (aggregated by commodity groups) considered to be representative of the population as a whole. Price observation and recording takes place in 42 towns in the country, and for each commodity group, a specific price index (IP_i) is calculated. Each product group is attributed a certain weight, which results from the structure of the population's money expenditures, according to certain complex statistical surveys. The result is the consumer price index for the economy as a whole:

$$IPC = \Sigma W_i \times \text{IP}_\text{i}$$

where W_i - the weight of each group in the total consumption expenditure; IP_i - the specific price index.

Based on the so-calculated price indices, the annual inflation intensity can be measured in the form of the *inflation rate (R_i)*:

$$R_i = \frac{IP_1 - IP_0}{IP_0} \times 100 \quad sau \quad R_i = IP - 100$$

To capture the magnitude of the inflation phenomenon, the currency *purchasing power index (*I_{pc}*)*, calculated on the basis of price indices (IP), can also be used:

$$I_{pc} = \frac{1}{IP}$$

It expresses the degree of currency depreciation / appreciation at different times of the analyzed period, that is the evolution of the currency purchasing power in relation to the price change.

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