QUANTITATIVE ASPECTS OF THE ECONOMIC GROWTH

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Abstract. In this study we want to make a particular study regarding the economic growth and its evolution in our economy. The economic growth is not just the result of the macroeconomic dynamic, but of the demographic dynamic as well, determined by the biological and social factors. The economic growth has to be regarded, as a dominant tendency in the frame of a long period of time and it must not be mixed up with the conjectural expansion on short term.

Economic growth is a complex process, which is aiming the economic system as a whole unit and its dynamics. The economic growth theory is being the centre of the present preoccupations, especially in the transition country.

The economic growth can be defined as the expression of those modifications that take place in a certain space, regarding the increase of the macroeconomic results' dimensions, and strongly correlated with the main factors.

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Regarded from the quantitative point of view, the economic growth can be surprised through the internal gross product's evolution, for example in real measure (adjusted with the dimension of the deflation).

The gross internal product synthetic frequently used for evaluate the different stages of one country's economic force.

The volume of the production obtained in one economy (given by the measure of the gross internal product) is determined by the available offer of labour and capital.

The available offer of labour is appreciated generally through the active population. According to the Labour International Bureau, the active population represents the segments of one country's population that includes the persons over 14 years old, which are occupied at least one hour per week, including the persons that temporary are on holyday, as well as the persons that are unemployed.

In time, the active population is being modified as a result of the influence of more factors:

o The evolution of the entire population of one country (majority of the countries are facing a diminution of the birth rate);

o The immigration of the active population (increasing or decreasing the active population can be determined by the reverse of the migration fluxes, as a result of the deporting of the foreign workers that do not have legal papers);

o Increasing the school period;

o Retiring age (generally there is the tendency of increasing the active life – in Romania is desired the gradual decrease till 2010 of the retiring age at 60 for women and 65 for men).

Modifying the dimension of the active population has effects upon one phenomenon that affects many countries – unemployment. Unemployment can be generated by an increase of the active population considering a slow increase of the working places, either by a decrease of the active population in a small measure than the diminution of the gross intern product.

Is being considered that the conditions of the existence at one moment of the equilibrium on the labour market, if it appears the population increasing determined by the demographic situation, that being favouring the social flexibility (changing the working place depending on the measure of the salary) ad the professional mobility, and on the other hand, is slowing the substitution of the work with the capital.

If the labour (appreciated through the dimension of the active population) is not a reproducible factor, the capital is considered such a factor. Attempts of defining the capital belong to the greatest economists, among which the most suggestive belongs to R. Barre. In his vision, the capital represents "an ensemble of the economic resources heterogenic and reproducible, which through an indirect using allow the periodical obtaining of an income."

We are deducing the defining characteristics of the capital category:

o The capital is incorporating the heterogenic resources – raw materials, materials, equipments, intermediary products, money, credit titles, consump-

tion goods meant for the employers involved in producing those economic products;

o Reproducible character – capital is formed from goods which are producing and reproducing systematically and not from the resources with permanent character, irreproducible;

o Capital goods are designated for an indirect use, not for direct satisfaction of consumption needs;

o Capital goods assure the systematic and periodical obtaining of an income (gross internal product at the national level).

The last characteristic is very important because in the absence of producing one income, the resources from above are not becoming existing shape of the capital.

The functional dependence between the technical capacities and the human resources from one country, on one hand, and the real nation production, on the other hand, can be illustrated with the help of the production functions, which in a general shape are the following:

$$Y(t) = F[K(t), L(t)]$$

This function of production can take various forms, among which the most frequently used is the Cobb-Douglas function:

$$Y(t) = A \cdot K(t)\alpha \cdot L(t)\beta$$

where:

Y is the real production of the nation;

L is the active population of the country;

K is the capital stock of one country;

α is the varying coefficient of the production depending on the capital modification;

β is the varying coefficient of the production depending on the labour modification;

A is the technical progess.

The hypotheses that are the base for this function are the following:

o The production is depending on the two factors exclusively;

o The scale efficiencies are constant;

o The obtained product is given by the sum of the marginal productivity of two factors;

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o Capital and labour are perfectly substitutable;

o $\alpha + \beta = 1$;

o If the factors are remunerated at the marginal productivity's level, then 3b1 and 3b2 are equal with the proportions that the production factors have in the total product.

For the Cobb-Douglas function we are having the following data:

GIP	L	K
5809	6125	320.2
6293	6252	341.4
6012	6127	332.5
6384	5946	318.0
6241	5862	328.1
6761	5952	351.2
7047	5938	363.4
6771	5784	349.7
6520	5664	368.5
7035	5850	377.2
7120	5845	380.9
7200	5703	366.2
7111	5525	379.9
7380	5511	384.2
7150	5399	383.0
7400	5150	385.9

The relation between production, capital and labour can be shown graphically with the help of the multiple linear correlation coefficients, as it follows:

$$R^2 = \frac{\hat{a}^T (X - X')^T (Y - Y')}{(X - X')^T (Y - Y')}$$

where:

$\hat{a}$ – is the metrics for the estimated parameters;

X – is the metrics of the exogenous variables;

Y – is the metrics of the endogenous variables.

In this case for our population $R^2 = 0,82763$.

If we are testing the signification of the multiple linear correlation coefficient for the considered population, with the help of Fisher-Snedecor probability rule, we discover that the correlation coefficient is significant.
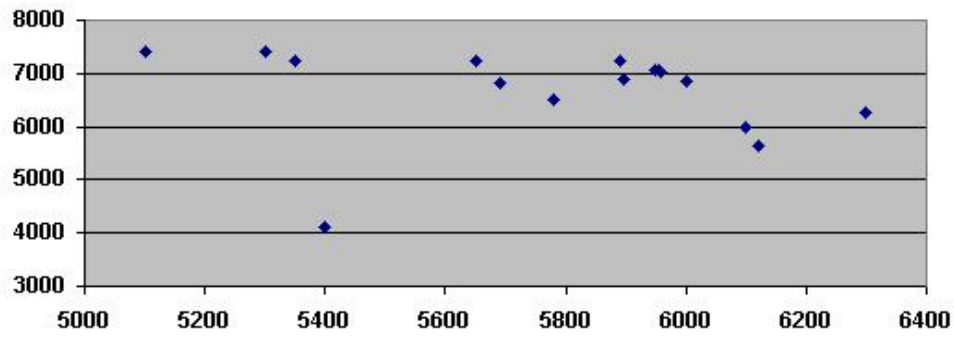
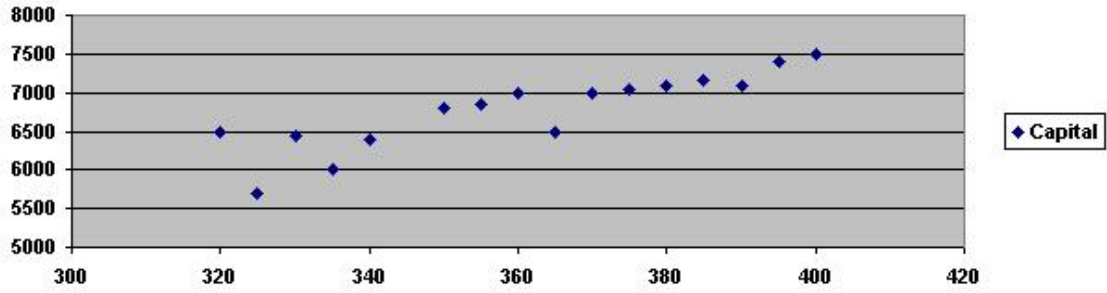Figure 1: The correlation between production's volume and labour resource

Figure 2: The correlation between production's volume and capital stock

The new series of data are:

Nr.	z	x	T
1	8.667164	5.768946	8.720134
2	8.747193	5.833055	8.740657
3	8.701513	5.806640	8.720461
4	8.761550	5.762051	8.690474
5	8.738896	5.793318	8.676246
6	8.818926	5.861356	8.691483
7	8.860357	5.895504	8.689128
8	8.820404	5.857076	8.662851
9	8.782630	5.909441	8.641886
10	8.858653	5.932776	8.674197
11	8.870663	5.942537	8.673342
12	8.881836	5.903180	8.648748
13	8.869398	5.939908	8.617039
14	8.906529	5.951163	8.614501
15	8.874868	5.948035	8.593969
16	8.909235	5.955578	8.546752

So, in conclusion, we can affirm that the increase of the available capital in an economy determines the increase of the production in a bigger measure, and the population modification determines in a small measure and in the same sense.

References

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