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The Mechanism of the Relationship between Population and Economic Development

Population growth is closely connected with the economic development influencing each other with visible effects, usually after a long period of time within a complex mechanism and under various circumstances.

The adjustment mechanism between population and economy is achieved through a system of economic, social, intermediate and demographic variables. These interdependence connections are not manifested directly but through intermediate variables, the latter being set in motion by the economic development. The feedback system in the demographic processes is different, manifested either very rapidly or very slowly, according to conditions. The relationship between economic and population growth is inconceivable without modelling which requires joint measures of economic and demographic policy. It is part of a dynamic optimum or a zone of economic-demographic optimum which can rely on a multitude of criteria varying according to the concrete conditions in each country.

The essential problem of the relationship between population and economy is that of development, of the increase of material production, of the use of natural and human resources in each country.

PRELIMINARY CONSIDERATIONS

The correlation between population and development is extremely complex a fact which creates difficulties in explaining the general laws valid for all countries without taking into account their standard of economic development, the specific conditions as well as the historical stage covered by them.

At the same time, one cannot overlook the fact that the cover of the economic factors operates on a multitude of other factors with a specific character: national, social, cultural, religious, psychological and especially behavioural factors which are more difficult to be included into models and general theories. Then, the causal relationships between population and development are sometimes manifested in a form covered in effects which are visible and quantifyable only after a long period of time according to the cycle of generations, which obviously creates obstacles in the way of analysis.

Despite all these difficulties and, nevertheless, starting from a complex and multilateral analysis we come to the conclusion that no matter the point of view from which we would consider them, the population growth is closely connected with the socio-economic development, the economic and demographic variables are interdependent with perceptible and quantifiable effects, usually after a long period of time, within a complex and sometimes contradictory mechanism and in a great diversity of economic, social, historical and cultural conditions.

The explanation of these connections might be facilitated by an attempt at dwelling on the problems of the population within the socio-economic system of a cybernetic type, a fact which enables the explanation of the component elements, the connections in their interdependence. Of great use in this respect are the economic growth models and the main correlations in the cybernetic system which were presented for the first time in Romania by Academician. Professor Manea Mănescu [1].

Worth mentioning within this framework are at least four problems.

1. The population is integrated into the socio-economic system, by extremely flexibile and complex connections. "Undoubtedly, N. Wiener points out: the social system is an organized whole just like the individual; it has a dynamics in which the feedback circular processes are playing an important part. This is valid for the general domains of anthropology and sociology and for the more special domain of economy [2].

2. The population integrated into the economic development appears as an extremely complex category because it belongs both to biology and to the social system. The mechanism of production relations influences man's biological nature, because man is the product of social development. It is known that in the theses on Feuerbach, underlining that man is the product of the totality of social relations, Marx did not deny the biological nature of homo sapiens.

3. The feedback system in the demographic processes can be diferent: in some cases very rapid, such as, for example in death problems (earthquakes, hunger, floods, wars and epidemics), in food problems (water, natural resources, etc.) and in other cases very slow, sometimes imperceptible, the quantifiable effects being manifested after a long period of time, such as, for example, the demographic ageing, changes in the quality of labour resources, especially the modification in the demographic behaviour.

4. The interdependence between development and population is not usually directly and immediately manifested, but, through intermediate variables (nuptials, the average age on marriage, abortion, counterceptives, the demographic behaviour).

In the last analysis, the economic development influences the population growth and, the latter the economic growth. Yet, in the field of population policy, a rapid feedback reaction insufficiently analysed, ignoring the laws of the system with its specific character, might have negative implications for a long period of time and on multiple plans even for several generations. Therefore, the practical measures for the improvement of the population system should be based on the finding and utilization of the objective mechanisms of selfadjustment and adjustment under certain circumstances of the historical, economic and social development, because otherwise any measure of the population policy, no matter how important, may cause disturbances for a long period of time.

The relationship between the economic and population growth becomes inconceivable today without modelling, through joint measures of economic and population policy. Consequently, the modelling process can be achieved in two ways which are closely interdependent: a) through the selfadjustment system according to the interdependence between the economic and demographic variables, within the general strategy of the socio-economic development and b) through the adjustment system, according to the tactical necessities, through measures of the population policy, respectively the more rapid stimulation of population growth or the slackening of its growth rate.

THE ADJUSTMENT MECHANISM OF THE RELATIONSHIP BETWEEN POPULATION AND ECONOMY

To understand the relationship between population and economy it is necessary, in the first place, to choose a system of socio-economic variables according to their role and place in the functioning of this mechanism.

For this, we must rely on such a system of variables which should express: a) the essence of the economic and demographic phenomena and the fundamental connections between them; b) should have a great capacity of characterization and synthesis; c) should be quantified; d) should not be in a too large number.

From the point of view of connections, they might be classified into economic, social, intermediate and demographic variables.

A. **Economic variables:** upholding development: 1. Capital, volume of investments or fixed assets; 2. Labour resources; 3. Natural resources; 4; Internal product or the national income; 5. Economic structure on branches; 6. Zonal distribution of productive forces.

B. **Social variables:** 1. Structure of active population on sex and sectors (primary, secondary, tertiary); 2. Territorial mobility; 3. Education stock; 4. Socio-professional structure; 5. Social environment (urban, rural); 6. Living standards.

C. **Intermediate variables;** 1. Average age upon marriage; 2. Nuptials (coefficient of marriages); 3. Abortion; 4. Counterceptives, etc. They are determined, in the last analysis, by the demographic behaviour.

D. **Demographic variables:** 1. General and specific fertility; 2. General and specific death rate; 3. Natural growth; 4. Population's growth rate; 5. Structure on groups of age; 6. Average life expectancy.

The mechanism between the economic development and its impact on fertility is schematically presented in figures 1 and 2.

Thus, the economic development indirectly acts through socio-economic factors, on the intermediate and demographic factors, in the last analysis leading to the tendency of a decrease in fertility. This mechanism evinces the importance and priority of the economic development on the evolution of fertility. At the same time, women's employment in the economic and social life, under the conditions of ample processes of territorial and socio-professional mobility causes modifications in the demographic behaviour as well. In this connection, the socio-cultural factors have a more direct action on the typology of fertility. The relationships between the economic development and the population growth are not automatic, even the relationship between the two variables — birth and death rate is being adjusted by a relatively long process in which enthropy factors of a cybernetic nature may interfere as well as disturbances due to reasons which are not directly connected with the standard of development. As an example, we may consider the population explosion which caused, in the first place, in the years after the war, a rapid decrease of general and infantile death rate in the countries of the third world. In their turn, the demographic variables may influence the economic development in one way or another according to the type of a very high or low fertility, through some subsystems such as the volume and structure of labour resources, the indices of economic dependence, the school-aged population, etc. The conclusion can be formulated that a rapid economic development with profound changes in the economic and socio-professional structure may lead to a sensible decrease of fertility with implications of long standing on the population's growth rate and on the demographic improvement.

Figures 1 and 2 present only the mechanism between fertility and the economic development as a feedback. The way in which the mechanism is oriented depends on the concrete conditions in each country, on the standard of development, the historical conditions and the economic and population policy.

Naturally, a very high fertility level may cause a number of difficulties in many countries, a fact which requires measures of population policy just as, on the contrary, a too marked decrease of fertility may raise obstacles in the way of economic development, the relative and absolute reduction of labour resources, the qualitative change in the age groups of the employed population, the influence on social labour productivity, etc.

The problem is raised to optimize fertility, under the conditions of the economic development, to maintain it within convenient limits, a fertility which may be adjusted through joint measures of economic and population policy, by integrating the demographic variables into the context of socio-economic development.

THE ECONOMIC-POPULATION DEVELOPMENT AND OPTIMUM

The theories and models of economic and population growth grasp the complex processes of integration of the demographic variables into the economic growth models. This must take into account the extremely complex

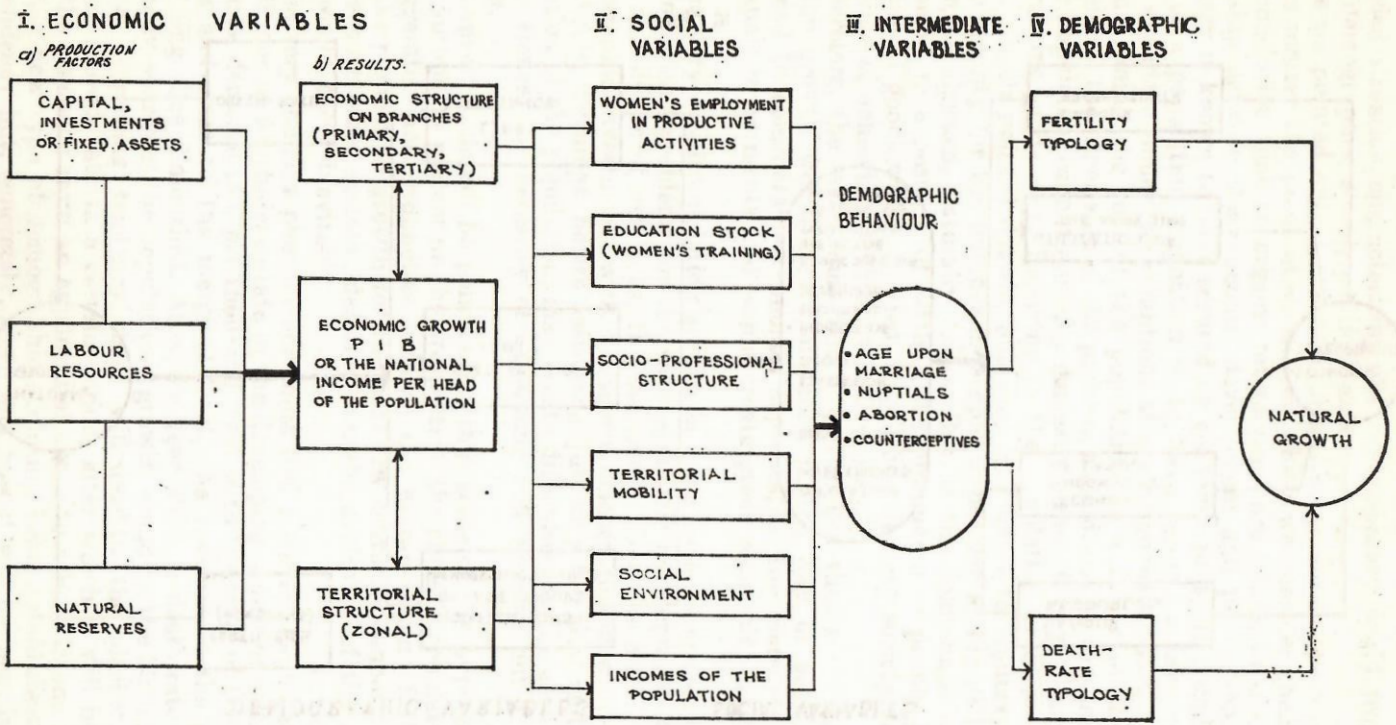
I. ECONOMIC VARIABLES
a) PRODUCTION FACTORS
b) RESULTS.
II. SOCIAL VARIABLES
III. INTERMEDIATE VARIABLES
IV. DEMOGRAPHIC VARIABLES
CAPITAL, INVESTMENTS OR FIXED ASSETS
LABOUR RESOURCES
NATURAL RESERVES
ECONOMIC STRUCTURE ON BRANCHES (PRIMARY, SECONDARY, TERTIARY)
ECONOMIC GROWTH P I B OR THE NATIONAL INCOME PER HEAD OF THE POPULATION
TERRITORIAL STRUCTURE (ZONAL)
WOMEN'S EMPLOYMENT IN PRODUCTIVE ACTIVITIES
EDUCATION STOCK (WOMEN'S TRAINING)
SOCIO-PROFESSIONAL STRUCTURE
TERRITORIAL MOBILITY
SOCIAL ENVIRONMENT
INCOMES OF THE POPULATION
DEMOGRAPHIC BEHAVIOUR
• AGE UPON MARRIAGE
• NUPTIALS
• ABORTION
• COUNTERCEPTIVES
FERTILITY TYPOLOGY
DEATH-RATE TYPOLOGY
NATURAL GROWTH

Fig. 1.

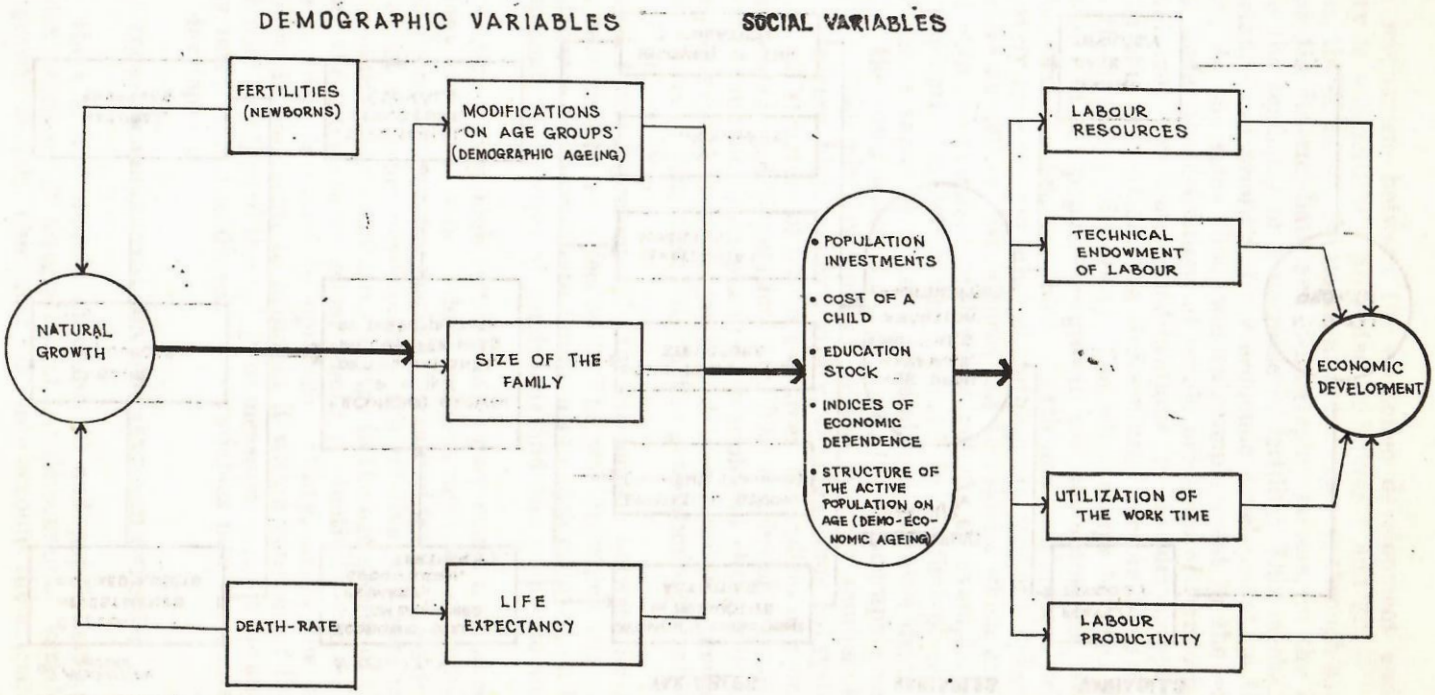
DEMOGRAPHIC VARIABLES
SOCIAL VARIABLES
FERTILITIES (NEWBORNS)
MODIFICATIONS ON AGE GROUPS (DEMOGRAPHIC AGEING)
NATURAL GROWTH
SIZE OF THE FAMILY
DEATH-RATE
LIFE EXPECTANCY
• POPULATION INVESTMENTS
• COST OF A CHILD
• EDUCATION STOCK
• INDICES OF ECONOMIC DEPENDENCE
• STRUCTURE OF THE ACTIVE POPULATION ON AGE (DEMO-ECONOMIC AGEING)
LABOUR RESOURCES
TECHNICAL ENDOWMENT OF LABOUR
UTILIZATION OF THE WORK TIME
LABOUR PRODUCTIVITY
ECONOMIC DEVELOPMENT

Fig. 2.

and varied situation characterizing the contemporary world from the economic, demographic, social, political points of view.

As we pointed out at the beginning, by examining these complex aspects no matter the point of view from which we consider them, we come to the conclusion that an organic interdependence exists, in essence, in the relationship between the economic development and population, as so far, no country is known to have secured an economic prosperity under the conditions of a population stagnation or to have secured a favourable demographic evolution under the conditions of a continuous economic stagnation.

Underlining the role of the population as a factor of the economic development, the other side of the problem should also be examined, namely that the population cannot multiply endlessly either, biological and economic limits existing in its way. Referring to the population problems already in 1881, F. Engels pointed out the following in a letter to Kautzky:" the abstract possibility for the number of people to become as big as their multiplication be checked, naturally exists. But, if the communist society will sometime be in a position of settling the production of people just as the production of goods will be settled, it will be this very society and only itself capable of achieving it without difficulties [3].

Therefore, the fact should not be overlooked that a too high rate of population growth would create obstacles in the way of development, it would lead to considerable economic expenses, to the increase in price of demographic investments and would create great economic and social lacks of balance.

The very rapid population growth in some developing countries raises, indeed important problems for the socio-economic development, the solving in time of millions of new jobs, the increase of food resources, the raising of demographic investments with a longer efficiency linked with the setting up of schools, dwellings, health assistance, just as a too slow and moreover, a stagnation of the population, may create difficulties in the economic development. Hence, the necessity of examining and working out a population optimum.

However, it should be pointed out that some of the hypotheses made by some authors at present on the prospects of the planet's population growth are exaggerated and groundless because the extrapolation of the present rate of the population growth for the next few centuries cannot be justified at all, because other factors "deciding" on the evolution of the population growth would occur inevitably.

This very complex phenomenon must find a correct explanation under the conditions in which death-rate in the developing countries will, according to forecasts, decrease to 8 per thousand, that is to the level of the developed countries and close to the marginal limit, the reserves of the population growth being thus diminished. After the year 2000, if death-rate is stabilized, the only source of the population's growth would be the birth-rate which showing a decreasing tendency itself will lead to the slackening of the population growth rate in a certain period, after which it will become stabilized, the tendency from an exponential curve to a logistic one being thus modified, a new type of demographic evolution being established. This will be the tendency but, concretely, when and how it will happen, is more dif-

ficult to envisage. It is certain that neigher the population nor the economic growth can be continued at their present rate. According to some specialists, in the next century, the population will stabilize around 10—14 thousand million people, at the same time, the economic growth being established at a certain optimum level.

What might be this optimum and what criteria might lie at its basis? P. Erlich, the author of the best seller "The Population Bomb" estimates that on our planet there is already a population which surpasses 5—7 times the necessary and sufficient number. According to Erlich, the statical population optimum is below 50 million inhabitants for the U.S.A. and for the globe, it would amount to 500 million inhabitants. In other terms, it would mean to reduce the number of inhabitants to the level our planet had in the year 1650. Of course, the idea of a statical optimum of the sort of that shown above cannot be acceptable because it would condemn mankind to stagnation, Thus, the problem is raised of conceiving a dynamic optimum or a dynamic optimum zone.

The working out of the population's optimum model and the criteria which have to be taken into account have considerably developed of late. Moreover, the population optimum was, at the beginning, associated with the limit of the satisfaction of food necessities (Malthus's model), later the natural, energetic and raw materials resources, the quality of life, the ecological environment, etc. being added to it.

An objective analysis of the working out of a population's optimum must consider as a starting point the connections between the demographic and the other phenomena. A multitude of optimizing criteria, with an economic, demographic and social character, which according to various authors varies considerably, might be included into the calculus. There can be many optimizing criteria but essential to me it seems that under the circumstances of an interdependence of the demographic and economic variables, the working out of a population optimum without an economic optimum is no longer possible. Under these circumstances, the criterion being an economic-demographic one, it is necessary to optimize economic growth in close relation with the optimizing of all types of the population movement, the setting up of a family optimum type inclusively. The population optimum just as the economic optimum may have a general value for each country's population policy but, the optimizing criteria may differ from a country to another, from a zone to another and from a period to another. Referring to the establishment of the population optimum, the well known French demographer Al. Sauvy considers that it must be a reasonable growth rate which is neither null nor extravagant and which does not imply very high expenses. He even considers that according to the experiments of the last 25 years, a population growth between 0.5—1% as a convenient growth would be necessary in Western Europe. [4].

Naturally, there cannot be a generally-valid optimum. There are many countries — especially with a big population and high denseness per surface unit — which are interested in and have taken certain measures for slackening the population's growth rate, — others — including Romania — consider

it proper to carry on an active, complex policy for stimulating birth-rate and for a population growth.

Therefore, under the circumstances in which, in the world, preoccupations are increased for working out models and theories of economic and population growth, with a tendency of integrating the demographic variables into the population and economic growth, an increasing interest also exists for the population policy, for its integration into the socio-economic policy.

In a general synthetization, the population policy must take into account the great diversification of the demographic situations varying from a continent to another, from a region to another, from a country to another and sometimes even inside the same country. The fundamental problem of the contemporary world and of politicians in the population field cannot be but the problem of the development and turning to account of the natural and human resources, of the continuous progress of all countries and especially of the developing countries. Highly important in the economic growth and in the raising of living standards in all developing countries is the drawing into the economic circuit of the considerable reserves which have not been turned to account, the improvement of the living conditions of the population, professional training, environment.

Particular attention should be granted to the measures aiming at reducing morbidity and death-rate in general, in the developing countries and the reduction of infantile death-rate in particular.

The complex problems of the population's integration into the socio-economic development require an intensified international cooperation within a new world economic order, in the spirit of the observance of independence, sovereignty, equality of rights, non-interference in internal affairs, mutual advantage.

However, one thing appears clear and indisputable in all this. The measures of the population policy just like any other political measure of the states in general are the attribute of each country's sovereignty. A natalist policy is being affirmed in the economically developed countries for upholding and maintaining the economic growth rate. In the developing countries, to cope with the high rate of population growth, the governments in these countries are ever more relying on programmes of family planning by adopting, in general, an official policy of birth-rate limitation.

But, as experience shows no programme of family planning cannot replace the economic programmes of the countries, the levelling of economic disparities, the modernization of social structures as an essential condition for securing an optimum growth of the population, the thus said blending of the family planning programmes, of the programmes for levelling the disparities separating them from the developed countries.

The fundamental problem of the contemporary world, of the relationship between population and economy remains the problem of development, of the continous progress of all countries and, in the first place, of the developing countries. Therefore, the solving of the population problems should be integrated into the socio-economic development of the respective countries, of programmes of industrialization and of the intensification of agri-

culture which should ensure the increase of material production and the turning to account of the natural and human resources in each and every country.

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LE MECANISME DE LA RELATION ENTRE LA POPULATION ET LE DEVELOPPEMENT ECONOMIQUE

L'évolution démographique est étroitement liée au développement économique, les deux s'influant réciproquement avec des effets visibles, de façon courante après une longue période, dans le cadre d'un mécanisme complèxe et dans une grande diversité de conditions.

Le mécanisme de régulation entre la population et l'économie s'effectue par un système de variables: économiques, sociales, intermédiaires, démographiques. Ces relations d'interdépendance ne se manifestent que par des variables intermédiaires mises en mouvement par le développement économique. Le système de connexion inverse dans les processus démographiques est différent, se manifestant, ou bien d'une manière très rapide, ou bien très lente, en fonction des conditions. Le rapport entre la croissance économique et celle démographique ne peut être conçu sans la mise en modèle, qui recquiert des mesures conjuguées de politique économique et démographique.

МЕХАНИЗМ СООТНОШЕНИЯ МЕЖДУ НАСЕЛЕНИЕМ И ЭКОНОМИЧЕСКИМ РАЗВИТИЕМ

Демографическая эволюция тесно связана с экономическим развитием, так как они взаимно влияют друг на друга, причем результаты этого взаимовлияния становятся очевидными обыкновенно после долгого периода времени в рамках сложного механизма и в разных условиях.

Механизм регулирования между населением и экономикой осуществляется при помощи системы показателей: экономических, социальных, промежуточных, демографических. Эта взаимозависимость связей не проявляется немедленно, а посредством промежуточных переменных, так как эти последние приводятся в движение экономическим развитием. Система обратной связи в демографических процессах имеет некоторые особенности, она может проявлять себя либо медленно, либо очень быстро в зависимости от условий. Соотношения между экономическим и демографическим ростами немыслимо без моделирования, которое нуждается в взаимосвязанных мерах экономической и демографической политики.