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A Systems Approach to the Choice of Optimal Strategy of National Income Distribution

The general systems theory, applied to the field of theory and policy of economic development, provides numerous methodological advantages for a better understanding of problems in this area, as well as for better, i.e. more adequate decision-making on future development. That concerns both the general scope of approach and, what is particularly important, an approach corresponding mostly to the term "society in action". In other words, in reference to socialist countries which aims to engage all the participants in the process of social and economic development decision-making, a wide basis for their governing activities is required. Precisely, finding, defining and articulating this area of action in the crucial social task in which a systems approach is most helpfull.

We shall present the advantage of the systems approach applied to one of the crucial problems of development — national income distribution. [1]

1. ACCUMULATION — CONSUMPTION

We consider the belief that the optimal basic distribution of national income between accumulation and consumption according to the criterion of maximizing social welfare, may be reached by a mathematical formula or by an econometric model of growth, is misconsived. This is due to the fact that the relationship between accumulation and consumption in reality depends not only on economic but also on other factors which

[1] For the general importance of the systems approach in the development theory of a socialist society many authors deserve credit. Among them we mention Oskar Lange, Viktor Novozilov, Manea Mănescu, Georg Klaus, Evgeni Mateev.

are social, historical, psychological, political, etc. in caracter. At the same development level of large economic systems the optima of accumulation and consumption may and usualy differ, due to the different structure and functioning of the whole large social system, with all its subsystems being an environment of the large economic system.[2]

As we shall see, this applies also to the distribution of the total consumption between private and public consumption, as well as to the structure of both. There is no general model of optimal distribution for the given national income level and private and public consumption per capita, as they depend upon many factors: economic, biological, sociological, cultural, etc. ones.

As it is unjustified to adopt the optimal relation between accumulation and consumption, which is reached taking into account only a few exactly measureable purely economic factors, since this point optimality does not necessarily correspond to the social optimum, a broader area of optimality must be identified (established).[3] Within this area determined for a given large economic system (as a rule, for the period of one investment cycle) there is a whole set of valid solutions from which we chose one, in dependence on numerous factors as well as on the power distribution of various social groups, by using the theory of strategic games and other adequate methods.

We shall present these areas of optimality more fully by identifing the following relations: 1. accumulation-consumption, 2. real accumulation-monetary accumulation, 3. private consumption-public consumption. In that we should bear in mind that the socially and economically determined minimum of accumulation and consumption should not be threatened. The optimum always lays somewhere in the area between the social minimum of accumulation and the social minimum of consumption for the given large economic or social system.

Therefore, we shall present a diagram of possible interrelations between accumulation and consumption in the process of movement and development of a large economic system, showing the limits of permissible minimum of consumption and permissible minimum of accumulation, and the area of optimality situated between those two limits. It is convinient to present the area of optimality concerning the two stages of investment cycle, as a typical medium-term period.

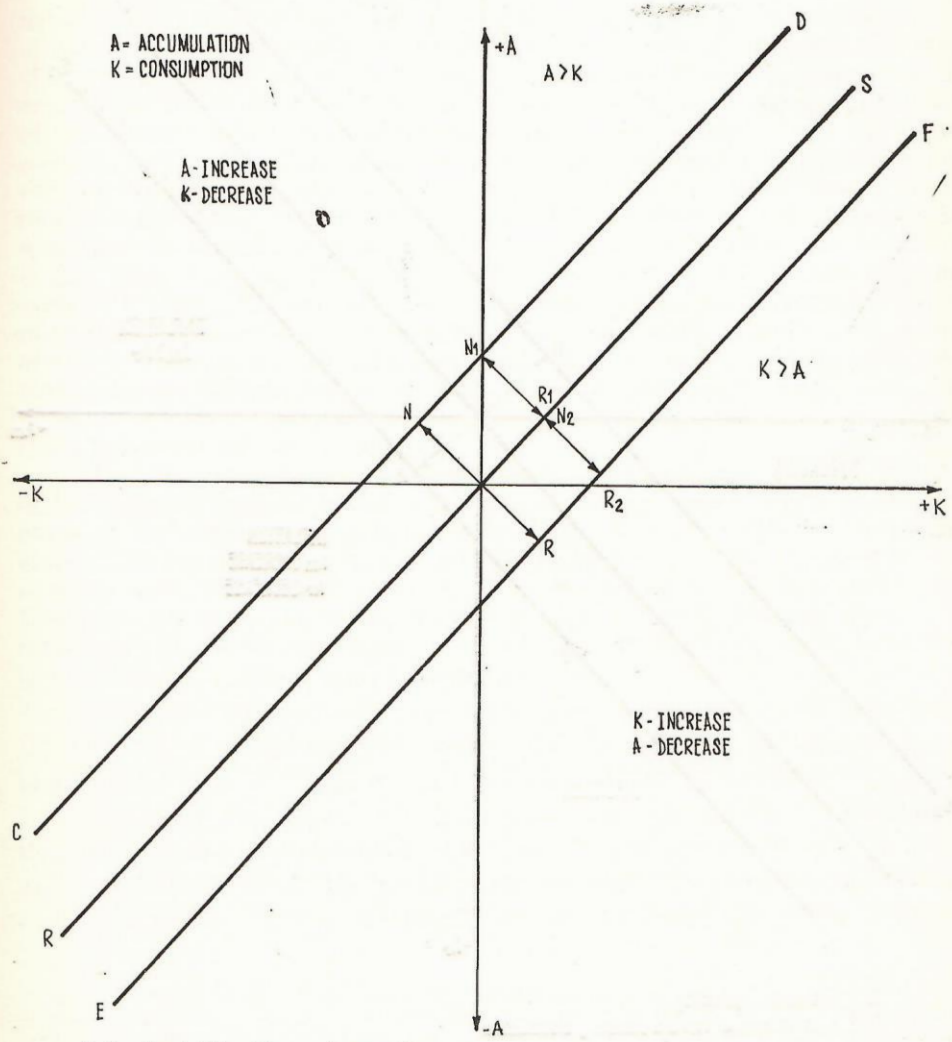
Previously we would like to mention that Oskar Lange[4] presented the area of permissible solutions, i.e. permissible development programs, graphically in the following way:

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[2] Some interesting ideas regarding this topic are presented in: Evgeni Mateev, "Perspektivnoe planirovanie i ekonomicheskaja kibernetika", particularly in part two of Chapter VI, entitled "Obshchaja harakteristika optimizacii" (p. 230–236).

[3] Oskar Lange, as many other authors in the field of programming, calls this area of optimality "an area of permissible solutions". Or, in his opinion too, the task of programming consists of two parts: determine the "area of permissible solutions", and then reaching the optimal solution, or optimal solutions, if there is more than one. (Oskar Lange, "Optymalne decyzje – Zasady programowania", Warszawa 1964).

[4] Oskar Lange, Op. cit.



C-D = Permissible minimum of consumption
E-F = Permissible minimum of accumulation
R-S = Mathematical optimum of the relation accumulation-consumption
N-R = Area of optimality during one investment cycle
N_1-R_1 = Area of optimality in stage I of the investment cycle
N_2-R_2 = Area of optimality in stage II of the investment cycle

Fig. 1

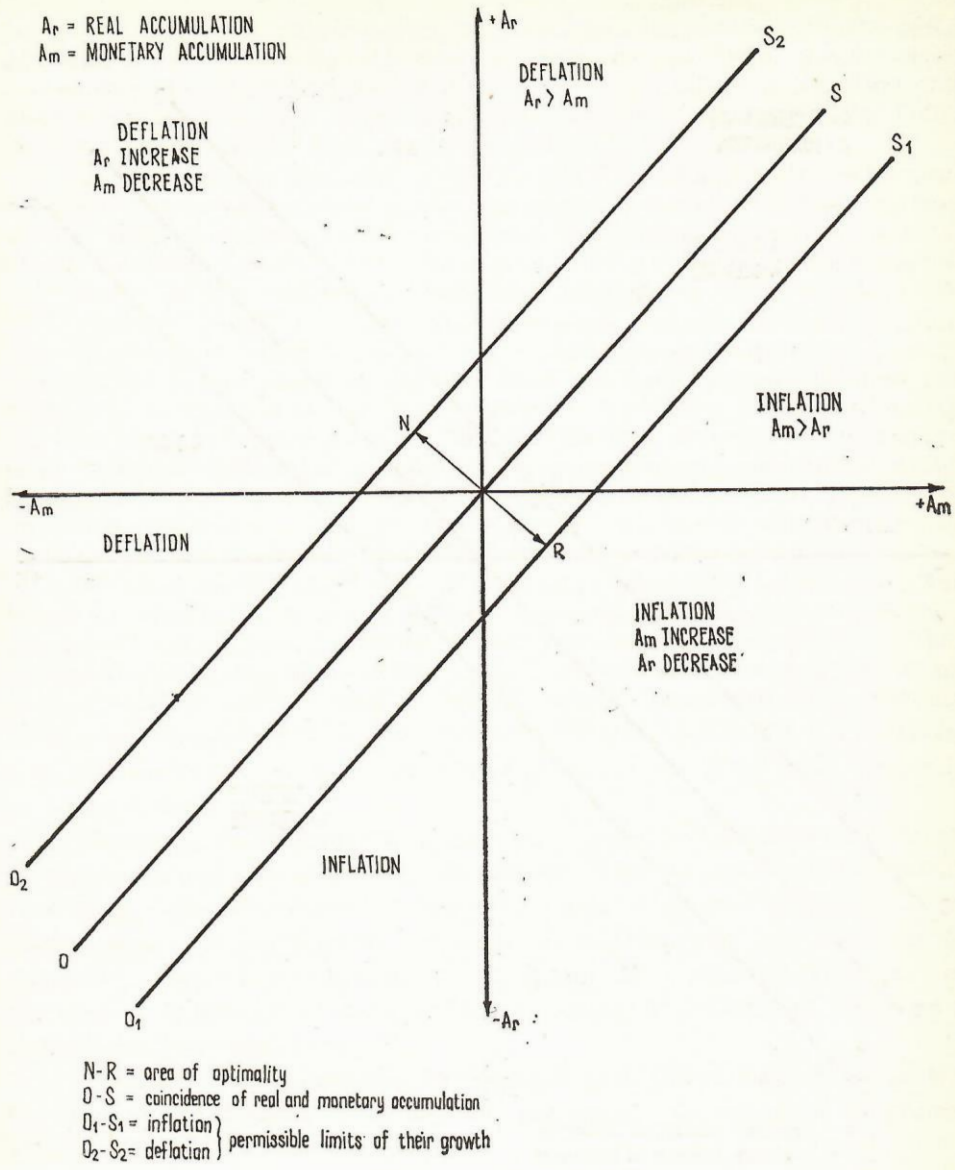


Fig. 2

even the economically optimal solution may differ from the socially optimal one under the influence of the following reasons: defence of the country, international political relations, internal political relations (for example, the relation between various social and ethnic groups, etc.), a necessity of a more harmonious development of other subsystems of a large social system, etc.

We proceed in determining more precisely the area of optimality between accumulation and consumption ($N - R$).

As we can see from the diagram, the area of optimality ($N - R$) lays between the permissible minimum of consumption for a given large economic system and the permissible minimum of accumulation. During the first stage of investment cycle, in the conditions of constant stable growth of the economy as a whole, the optimum will be on the line $N_1 - R_1$, i.e. a more rapid growth of the accumulation ratio occurs followed by the oposite movement of the consumption ratio. It depends upon various and numerous factors where exactly the optimum will be, but it must lay in the indicated area. In the second stage of the investment cycle a more rapid growth of the consumption ratio than the accumulation ratio will occur, and the optimum will be somewhere in the area $N_2 - R_2$. Naturally, we have in mind a stable large economic system. If the system is destabilized even with a hypotetical absolute decrease of consumption and accumulation, there are areas where a more rapid decline of the consumption ratio (the first stage of an unstable system) alternates with a more rapid decline of the accumulation ratio (the second stage of an unstable system). Then the areas $N_1 - R_1$ and $N_2 - R_2$ must lay in the third quadrant of our diagram.[5]

The field of optimal decision-making regarding the basic distribution of the national income between accumulation and consumption in the first stage of the investment cycle is in the limits $N_1 - R_1$, while in the second stage of the investment cycle it moves to the limits $N_2 - R_2$. The limit $N - R$ is more easily established in practice, while finding the optima within particular stages of the investment cycle is more difficult. Making specific decisions within particular stages, when a transition from one stage to another is to be made, requires adequate information.

Therefore, the basic problem for a given economic system is to locate the limit of accumulation and consumption (permissible minimum), i.e. to identify the span in which optimal decisions are to be reached. Though we cannot calculate the optimal relationship between accumulation and consumption in a purely mathematical way, such attempts have oft en been made and even introduced in the plans of the economic development of some socialist countries. Such a mathematical optimum, calculated for a chosen

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[5] We would like to mention thát the second quadrant is typical only for a so-called period of primary industrialization of underdeveloped socialist countries. In this case reaching a high growth rate calls for such a high level of accumulation which apsorbs not only the whole absolute increase of national income but slaso a part of previously reached consumption. However this is a very specific and relatively short-term situation, particularly if we take into account not only private but total consumption.

Considering only private consumption, it's decrease is to be expected in the period of primary industrialization. Nevertheless, in this period as well which is shown in the diagram, and is confirmed by historical cases of socialist development in the world, there exists an optimal relationship between accumulation and consumption, i.e. a limit up to which accumulation may increase on account of consumption. The whole effort of overemphasizing accumulation may become meeningless when the social costs generated by an absolute decrease in consumption tend to neutralize the social benefits from increased accumulation, bearing zero effect on the general growth rate.

time period[6] in which both consumption and accumulation are highly increasing, i.e. when the most stable and durable growth of consumption is secured, never coincides with socialy optimal relationship between accumulation and consumption. This is due to the fact that the social optimum, as we have already stated, is not a mathematical optimum since it is arrived at through the interaction of numerous sociological, historical, political, cultural, geographical[7] and other factors most of which are unmeasurable whose influence can not be precisely determined. The interests of various social groups are heterogeneous, as well as the interests of various regions, and particularly those of different ethnic groups (in the case of a multiethnic country), of various industries (for example, the relationship between agriculture and the processing industry ,or more widely the relationship between the primary and the processing sectors). Furthermore, the interests of urban and rural, skilled and nonskilled, intelectuals and other strata of population may and usually differ.

Therefore, determining the optimal relationship between accumulation and consumption for a given economic system at a certain point in time, presuposes reaching a solution, respecting the existence of a countries specific "mixed development strategy", where total expected benefits are maximized taking into account their resulting distribution among the participants (or that losses are minimized and satisfactoraly distributed when such are expected. This proposed solution goes beyond simple Pareto optimality.

We consider other concepts of reaching optimal solution to be unrealistic as they lead to the design of a "perfect plan of economic development", which is usually "deformed" through the influence of various political requirements, certain regional or industry compromises, etc. However, taking into consideration various interests even at the early stages of plan formulation would be better as it would enable us to incorporate all those later "compromises", "political negotiations" and the influences of various regions and social groups, during the final stage of plan formulation when it is called for. Besides, while making decisions regarding the economic and integral social development the theory of strategic games and other newly developed methods should be used rather then inadequate methods which are currently in use. An immediate implementation of these methods that would enable identifing the matrix of costs and benefits, and finding solutions when benefits are maximized, or costs are minimized, and each particular participant reaches the best position, is required.

Individual and social optima. — A given optimal relationship between accumulation and consumption at a certain level does not assure optima at

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[6] As it is known, this period lasts, according to some authors, seven to ten and up to fifteen years, in dependence on what he took as a criterion in chosing the length of the time period for calculating the optimal relation between accumulation and consumption. For more details regarding various lenghts of time for calculating this optimum see in the following books: Michal Kalecki, "Zarys teorii wzrostu gospodarki socjalistycznej", Warszawa 1963; Nikola Čobeljić, Radmila Stojanović, "The Theory of Investment Cycles in a Socialist Economy", New York 1969; "Methods of Long-Term Planning and Forecasting", Proceedings, International Economic Association, London 1976; and others.

[7] The importance of geographical influence on the optimal relation between accumulation and consumption is often neglected in Eureopean economic literature.

the sublevels i.e. an optimal national income distribution does not guarantee the existence of such optimum at the enterprise level, nor does such distribution guarantee the fullfilment of individual interests. Therefore, the often repeated statement that in a socialist planned economy each individual benefits to a greater extent by submitting his behaviour to the requirements of social optima, than by pursuing his own goals, seems to be misplaced since the social optimum does not necesserily contain individual ones. It would be more appropriate to state that a greater coincidence of social and individual optima will occur in a system in which the social optimum is reached through *the pursuit of individual goals respecting social goal through imposed limits.*

We have already stated that a criterion of optimality for the total economic system (J) can not be simply defined as the sum of individual criteria of optimality (J_i), i.e. it never occurs that

$$J = \sum_{i=1}^{n} J_i$$

but always

$$J \neq \sum_{i=1}^{n} J_i$$

and therefore their difference can not equal zero. Namely, if social development is realized in such a way that priority is given to the whole rather than the parts, i.e. if more rapid development is achieved on the basis of previously existing individual interests, then the result of the above equation is positive. While, in the oposite case it is negative.

It would be best if both, the participants and society as a whole, could reach their optima at the same time. However this situation rarely occurs, and more often individual and social optima do not coincide. In that case the predominant factor wich determine the participants behaviour from the point of maximizing the social welfare i.e. which converges their behaviour towards social interest depends on the stability of the socio-economic system. In unstable systems, however, the individual can hardly see the connection between his own and social welfare and will proceed to reach his individual goals at any price, even completely in opposition to social interests.

In other words, this convergence of individual and social interests can be recognized only in stable systems, where an optimal relationship between accumulation and consumption equals realized ratios at both enterprise and industry levels as in the national economy as a whole. Naturally, it would be a crude simplification to expect a complete ratios coincidence, but one must tend to achieve the closest possible coincidence and to stay in the limit of a maximal permissible deviation.

Only a stable economic system is able to promote positive interaction of all participants,[8] and to make use of the effects of "associated labour" in such a way as to obtain all possible advantages (for example, by lowering costs due to the positive results of the feedback coupling activity or by some other direct or indirect external influences). The meaning of this social trend towards optimizing economic development basically consists of maximizing these different positive interactions.

In order to make maximal use of these interactions, and to get the system closer to the optimum, in the situation in which the economy is becoming increasingly complex, it is necessary to establish "social rules of behaviour" for all the participants of a large system in order to avoid centralized decision-making. Since there are small possibilities for centralized decision making as an economic system becomes increasingly complex, "social rules of the game" gain in importance, especially when an enterprise defines it's own goal function. When these rules are not clearly defined and everyone choose his own "rules of the game" (i.e. a stronger partner imposes his strategy to the weaker one), destabilization of the system will probably result, in which case optimization is completely excluded.

These "social rules of the game" must specifically regulate national income distribution and the structure of new investments. A clear formulation of these "social rules of the game" arrived at through a consensus of participants will ensure their exeptance and will bring forth a convergence of interest which will aneble society to approach the optimal state.

2. REAL AND MONETARY ACCUMULATION

When speaking of the optimal accumulation ratio we cannot avoid to mention that accumulation has two aspects: real and monetary, which are very difficult to synhronize. That is, both inflation and deflation may result depending on wheather the growth of real and monetary accumulation is more rapid. However, there are some significant differences between real and monetary accumulation:

a) the real accumulation is by definition in the possesion of the producers of the means of production, while the monetary accumulation is dispersed practically amon all producers not only as surplus value expressed in monetary terms and assigned to enlarged reproduction, but also to a great extent as a depreciation fund;

b) it is easier to control the real accumulation which, by its nature, cannot be artificially increased while this does not apply to monetary accu-

[8] For example, if in a multiethnic society each nation cannot separately benefit from it's independent policies, than such a society is unstable. In order to reach a stable large economic system, each ethnic group must be permited implement it's policies and be assured that it benefits more than it would if it were a member of some other community or independent.

Sometimes the advantage of participating in a wider community is shown in a broader market for products, or securing employment, or in obtaining sources of raw materials lacking in the given region, or in the possibilities for a higher specialization or a stronger integration, etc. Therefore, it is important to ensure benefits for each member participating in a wider community.

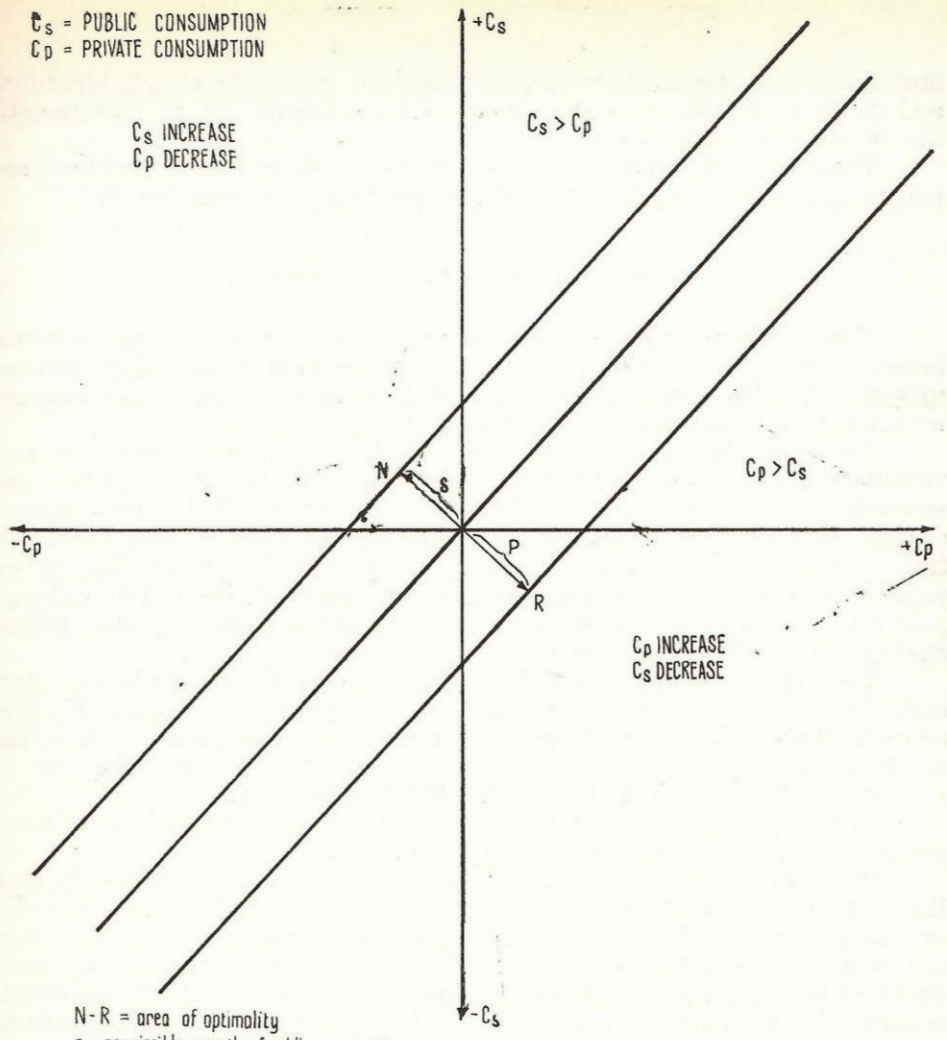

C_s = PUBLIC CONSUMPTION
C_p = PRIVATE CONSUMPTION
C_s INCREASE
C_p DECREASE
+C_s
$C_s > C_p$
$C_p > C_s$
N
s
P
R
-C_p
+C_p
C_p INCREASE
C_s DECREASE
-C_s
N-R = area of optimality
s = permissible growth of public consumption
p = permissible growth of private consumption

Fig. 3

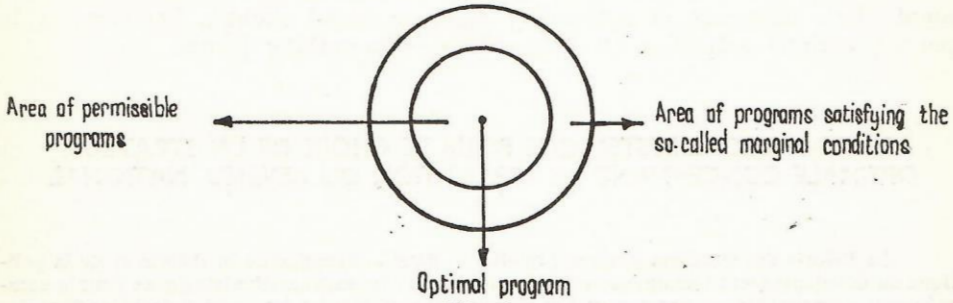

Area of permissible programs
Area of programs satisfying the so-called marginal conditions
Optimal program

Fig. 4

mulation which, due to its enormous dispersion, cannot be clearly identified, and can be artificially increased (by large bank credits, by an unpurposeful use of various funds, etc.).

Possible relationships, i.e. coincidences and discrepancies between real and monetary accumulation will be presented on a diagram No. 2.

3. PRIVATE AND PUBLIC CONSUMPTION

Finally, the third problem concerning the choice of the optimal national income distribution strategy is finding the optimal relationship between private and public consumption; i.e. finding the optimal relationship between maximization of individual and social welfare.

Two basic factors evidently influence this optimum: firstly, the previously generaly achieved level of social and economic development and secondly, political, sociological and historical conditions, that is the influence of other subsystems of a large social system on the economic one. Therefore, this optimum differs in various stages of development but also depends on political and social power relationships, on inherited traditions, external political situation, etc. This leads us to the problem of choosing the optimal strategy of development once again.

The experience of socialist development shows these aspects are alternatively more or less emphasized i.e. in some periods stronger individual interests that lead to diversifing of economic structure are stressed, while, in others, more harmonious socio-economic development and removal of structure disproportions and "bottlenecks" is called for.

In the following diagram three different possible relationships between private and public consumption are presented.

We close this short exposition of the dynamic optimal national income distribution concept stressing again the significance of the broadest social outlook concerning this optimum, and pointing to the complex interaction of different factors with cumulative effects, bearing in mind the basic systems approach principles. Above all else, in order to pursue an integral approach to social development we must assure active participation of all members of society, especially in reaching important development decisions such as those regarding national income distribution. To conclude this imposes the necessity of determining an sufficiently and clearly defined area of permissible solutions (an area of social optimality) on the basis of socio-economic development plan. This area of optimality must be broad enough, however, as to permit various activities at different decision-making levels.

UNE APPROCHE SYSTEMIQUE POUR LE CHOIX DE LA STRATEGIE OPTIMALE CONCERNANT LA REPARTITION DU REVENU NATIONAL

La théorie des systèmes généraux appliquée dans le domaine de la théorie et de la politique du développement économique offre de nombreux avantages méthodologiques pour la compréhension des problèmes appartenant à ce domaine, et pour la prise des décisions les plus adéquates

pour le développement futur. Cela comprend tant l'étude du but général de l'approche, qu'une approche adéquate, surtout du terme de « société en action ».

Nous referrant aux pays socialistes, qui ont pour but l'implication de tous les participants dans le processus de la prise des décisions pour le développement économique et social, il est nécessaire une base pour leur activité de direction.

De façon plus précise, trouver et définir ce domaine d'action représente une tache sociale d'importance extrême où l'approche systémique est d'une grande utilité.

Nous présenterons les avantages de l'approche systémique appliqués à l'un des problèmes les plus importants du développement — la répartition du revenu national.

СИСТЕМНЫЙ ПОДХОД К ВЫБОРУ ОПТИМАЛЬНОЙ СТРАТЕГИИ РАСПРЕДЕЛЕНИЯ НАЦИОНАЛЬНОГО ДОХОДА

Теория общих систем, применяемая в области теории и политики экономического развития присваивает определённые методологические преимущества занятию получшему пониманию проблем из этой области и по принятию наиболее адекватных решений, относящихся будущего развития. Это охватывает как изучение общеи цели подхода, так и. соответствующий подход, в особенности к термину «общество в действие».

Касаясь социалистических стран, имеющих цель вовлекать всех участников производства в процесс принятия решений о социальном и экономическом развитии, необходимо отметить, что нужна некоторая основа для их деятельности по управлению. Другими словами, нахождение и определение этой области человеческой деятельности представляет собой важнейшую социальную задану, для которой системный подход имеет важную фоль.

В настоящей работе выявляются преимущества системного подхода, применителью к одной из вожнейших проблем развития — к распределению национального дохода

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