

SOME ASPECTS OF THE IMPORTANCE OF INFORMATION IN THE  
PROCESS OF DECISION-MAKING IN THE SELF-MANAGEMENT  
SOCIETY

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I. INTRODUCTION

The new Yugoslav Constitution of 1974 and the Associated Labor Act of 1976 state a fundamental principle according to which if the performance of the Basic Organization of Associated Labor (BOAL), as a subunit of an enterprise, "can be expressed in terms of value within work of the organization in a market" (2)... the workers of that subunit will have the right and duty to organize as a BOAL. The BOAL is the holder of all social sector assets and has final authority over all decision-making (5).

As a result of the gradual decentralization of the increasing economic and self-management rights of working units, the BOAL shatters the classical concept of socialist state ownership. Namely, on the one hand, it develops in practice "the concept of the right to income as unalienable" (from workers and their associations) and, on the other, it practically realizes "the idea that self-management should be direct to the maximum degree" (2). That is to say, the BOAL lowers the process of economic decision-making to the decision level of every individual and enables the decisive and direct influence of citizens in their functions as producers and consumers.

The decentralization of economic decisions relates to the following decisions /1/: (1) fundamental macro-economic decisions mainly concerning the direction of social and economic development; (2) partial decisions (of sectors of production and enterprises) mainly concerning current operating problems of the economy; and (3) individual decisions relating to expenditure patterns, place of work, etc.

The Yugoslav economy is a commodity economy in which the rules of behaviour of the BOAL derive from the logic of the market me-

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chanism. In other words, there is a permanent tendency to transfer resources from less profitable to more profitable uses, and also there is the position of the national economy as a whole which becomes merely the resultant of the activities of individual economic units /1/.

Obtaining its revenue not by virtue of arbitrarily granted limits and funds but by effective selling, the BOAL extends the sphere of interest of the workers as joint owners of the means of production and thus in practice links the individual and the general interest. Namely, the realization of personal incomes depends on market competition, and this introduces the need for modernization, increasing production capacity in a given line of production, etc. As long as investments for expanded reproduction within enterprises are decentralized by the New Constitution and the Associated Labor Act, the self-managers in the BOAL make decisions on productive accumulation. Also, however, the self-managers as the delegates of their BOALs take part in the decision on the basic mass of investment resources which influence the social and economic development of the country.

In general, the dominant category in the process of economic decisions in the self-management society is the individual, who is treated as producer and consumer at the same time. The individual acts as a family member, then, in the BOAL, and as a delegate of the BOAL to a higher forum where decisions of social significance are made.

The process of decision-making (PDM) in the family makes the individual only a consumer or an individual who wants to realize only his consumer interests. These interests are called the utility of present consumption (UPC). But the individual interests become the producer interests in the BOAL /8/. In other words, the individual is a consumer and a producer at the same time. This might signify a conflict between the personal interests in the PDM, in the sense of consumer wishes, and the interests of the prosperity of the BOAL. If the producer interests are denominated as utility of future consumption (UFC), then we may say that there is a conflict between UPC and UFC. At first sight, the conflict between UPC and UFC exists in PDM. The individual wants to maximize his UPC because in this way he realizes his maximum consumption and increases his standard of living. Hence, he tries to distribute more of the income for his personal income instead of income for improving the production of "his BOAL". As the individual is the decision-maker in the self-management society, this means that he makes important decisions for his BOAL, and his personal income is subject to his decisions.<sup>1</sup> Consequently, the conflict between UPC and UFC exists in the BOAL.

In relation to the conflict between UPC and UFC, there is the concept of internal and external costs and benefits of production. Internal costs and benefits are subject to the individual as a producer. Making decisions via the market in his role as producer, the self-managing decision-maker gives rise to external effects which are not recorded through market-generated information. Extra-market informa-

<sup>1</sup> At this point, we assume that there is no problem in realizing production on a market.

tion on external effects, however, may contribute to the increment of total utility of the individual, enabling him to take into account the utility to himself as a consumer as well as a producer. Therefore, having in mind the market economy, the area on decisions to produce and sell differs from the area on decisions to consume and buy. The interaction between an individual's life in the BOAL and his family life does not exist, and so a conflict between UPC and UFC arises.

When the individual as a delegate in forums higher than the BOAL participates in the process of social decision-making, or when he participates in the process of social planning, a so-called "intergeneration problem" appears. This problem means a conflict between present and future generations in the sense of determining the loading measure of the present generation for ensuring the material bases which will enable the future generation to achieve greater total utility with less of effort and self-sacrifice. In this case, the following appear: (1) a conflict between UPC and UFC; (2) a conflict between the internal and external effects of production, and (3) a conflict between the total utility of the present generation and the total utility of the future generation. These conflicts should be solved by establishing the optimal loading of present and future generations.

It is clear that the former caught sight of the conflict situations appearing in the self-management society. The realization of these conflict situations influences social development. That is, the self-managing decision-maker has to be conscious of the correlation which exists between UPC and UFC, between the internal and external effects of production, and between the total utility of the present generation and the total utility of the future generation. Hence, when it is necessary to make a decision as to if and how much to deprive itself from an increment of UPC in favour of modernization or technical and technological innovation, decision-making should be exercised to the detriment of UPC. This is so because the increase of UFC influences the increase of UPC.

In the case of the internal and external effects of production, the decision-maker must objectively know what are the best effects of production. If he finds out that the best effects of production are the external ones, then he should analyze the utilities and disutilities of external effects and choose the utilities of external effects if they are greater than disutilities.

Finally, when the self-manager solves "the intergeneration problem", he must make decisions very carefully on the loading of the present generation to enable its optimal total utility. Therefore, the information system on the level of the BOAL as well as on the level of social planning has an important role in PDM in the self-management society /9/.

The purpose of this paper is to emphasize the role of information in PDM. Also, we intend to point to some attempts at the quantitative measurement of the information role in PDM on the BOAL level and on the level of social planning.

## II. THE ASPECT OF THE INFORMATION SYSTEM ON THE BOAL LEVEL

The main problem which appears in PDM in the BOAL is that each individual would not find investment rewarding if he were to consider a purely personal, isolated view of the costs and benefits of an investment decision. Namely, the self-managing decision-maker thinks only about maximization of his UPC and, therefore, makes decisions detrimental to UFC. This influences incorrect decisions or negative solutions to conflict situations on the BOAL level; if this occurs frequently and on a large scale, the result is a negative social development trend. However, if the individual is well-informed of the advantages of decision-making in favour of UFC, then in PDM the unilateral preferences lose their importance compared to collective preferences in investment /6/. In other words, when the information system is more developed, then a purely personal view of the costs and benefits of an investment decision has less significance in PDM compared to the collective view of an investment decision.

The self-managing decision-maker receives information from a market, as the site of the most sensitive social reaction. Market information shows how much it is necessary to improve or not to improve production conditions to make business more successful in the future. In addition to the market, the individual receives information from the accounting service which explains the past business performance of a given BOAL /9/. Taking into account information received, the individual forms his own view of the problem of conflict between UPC and UFC. Therefore, to have an objective solution to the conflict situation, it is necessary to offer such information to an individual which will enable the decreasing importance of unilateral preferences in investment decision-making.

The danger of a purely personal view of the costs and benefits of an investment decision in PDM can exist even with a relatively developed information system. In general, to discover the presence of unilateral preferences instead of collective ones in PDM, it seems necessary to quantify PDM. Namely, if PDM is quantified, we can observe where information is lacking or where an investment decision is made by the self-managers purely from their personal views of the costs and benefits of modernizing the process of production.

We should say that not very much is being done to quantify PDM. Nevertheless, it seems that Dyckman's /3/ contribution to the formulation of expected utilities might be helpful in that way. Therefore, certain attention is devoted to their formulation of the expected utilities.

Let us suppose: (1) that an immediate decision based on the given information is demanded; (2) that only single-stage problems are considered.

Let decision-maker I select one action at a single point in time. In selecting this action, the state of nature ( $\theta_j$ ) is received. The state of nature determines the outcome and the pay-off matrix.

"In decision problems, nature is a surrogate for all those factors that are beyond the control of the rational decision-maker" /3/. The probability of occurrence is important for each state of nature.

Decision-maker I guesses the incomplete information because it concerns the probabilities  $p_j$  of the various states of nature. Hence, in PDM self-managing, decision-makers must usually rely upon a subjective assessment of probabilities. If the decision-makers receive more information of higher quality, then their subjective assessment of prior probabilities will improve. This Bayesian problem for a single goal of prior information and subjective probability can be explained by the following table:

	State of Nature		
	$\theta_1 ; p_1 = f(\theta_1)$	$\theta_j ; p_j = (\theta_j)$	$\theta_n ; p_n = (\theta_n)$
Strategy: 1	$0_{11}$	.	.
.	.	.	.
.	.	.	.
i	.	$0_{ij}$	.
.	.	.	.
.	.	.	.
m	.	.	$0_{mn}$

From this table one can see the various outcomes ( $0_{ij}$ ) under different states of nature  $\theta_j$  ( $j = 1, \dots, n$ ) to which prior probability  $p_j = f(\theta_j)$  is attached.

Now we can calculate the expected utility for each strategy:

$$EU_i = \sum_j p_j U_{ij}(O_{ij}) \quad (1)$$

where  $U_{ij}$  are Von Neumann-Morgenstern utilities /4/.

In the case of more than one goal, we need to assign a performance indicator  $k$  ( $k = 1, \dots, k$ ) to each goal. We then have

$$EU_i = \sum_j p_{ij} U_{ij}(O_{ij^k}, \dots, O_{ij^k}) \quad (2)$$

If PDM in the BOAL is formed by the Bayesian problem, then the influence of the information received for making subjective probabilities can be analyzed. For example, if in the given time period the self-managing decision-maker knows more of the importance of depriving himself of his UPC in favour of modernizing the process of production in his BOAL, or if he knows that in the near future his UPC will be higher because it directly depends on the business success of his BOAL, then his subjective probability will reflect the decreasing significance of his purely personal view in making an investment decision.

In forming such a Bayesian scheme of PDM in the BOAL, it is necessary to have a discussion by the collective of self-managers or to proceed to an exchange of opinion on how to achieve the best effect of their production. Workers choose the one of the given strategies which will have the best outcome. That is, the self-managers choose the

maximum expected utility from all the expected utilities of all the strategies. If it is a case of more than one goal, then the maximum expected utility has to be chosen (2).

In practice it has happened and is still happening in the self-management society that some BOALs distribute their income in favour of personal income. As a consequence, they have smaller funds of accumulation and therefore cannot modernize their process of production and often cannot realize the result of their production in a market. Difficulties arise and are reflected in the personal incomes of workers or in the smaller UPC of self-managers.

The new Yugoslav Constitution and Associated Labor Act stipulate the rights and obligations of the workers in BOALs to decide on productive accumulation. This means that the self-managers must be aware of the importance of improving the process of production in a commodity economy.

If the workers of BOALs are well-informed, which means that they solve the conflict between UPC and UFC in favour of modernization of the process of production, then the BOALs contribute to optimal social development.

If the workers are not well-informed, then they will not objectively calculate and choose the maximum expected utility of a given strategy. Namely, the self-managers will choose the strategy which will solve the conflict between UPC and UFC in favour of UPC.

From the point of view of the concepts of internal and external costs and benefits of production, also, the information system plays a considerable role. Self-managers as producers do not receive market information of the external effects of the production of their BOAL. The external effects of BOAL production, however, contribute to the decrement or increment of the total utility of the present generation and form the basis of the decrement or increment of the total utility of the future generation. Hence, in PDM, it is necessary to be informed on the BOAL level of the interaction between the area on decisions to produce and sell and the area on decisions to consume and buy. If the producer makes decisions taking into account the external effects of his production, he contributes to the increment of the total utility of his generation. In other words, he might have less of his UPC but indirectly he would have more of his UPC because of the external utilities of production.

### III. THE ASPECT OF THE INFORMATION SYSTEM ON THE SOCIAL LEVEL

In PDM on the "intergeneration problem", the self-manager has to decide on whether or not to deprive the present generation of achieving the maximum of total utility and whether or not to enable the future generation to realize the maximum of its total utility. On the social level, it is a matter of choice of strategies with multigoals, which means that PDM is more complex than on the BOAL level /7/. Namely, now the self-manager has to decide which goal will have priority in the

next planning period and a hierarchical scale of all goals must be made. The self-manager has to make decisions which will ensure the best possible social development while not bypassing any of the social goals.

By all means, available information helps to make objective decisions in the sense of an optimal solution to the "intergeneration problem", but the role of the information system is more important on this level than on the BOAL level. This is because the self-managing decision-maker has to solve the conflict which arises in himself, the conflict of the individual who is both a consumer and a producer at the same time. Hence, to make optimal decision, the self-manager must be well-informed of the importance of UFC instead of UPC. Also, he has to know how to measure the internal and external effects of production, not only the production of his BOAL (of which he is a delegate) but also the production of any BOAL of his society. Being well-informed of these two conflict situations and solving them in an optimal way, he can presumably solve "the intergeneration problem" which is supposed to be closer to an optimal solution.

As "the intergeneration problem" is the multigoal problem, the Bayesian scheme discussed in the previous section can be helpful in the quantitative measurement of PDM on the social level. This scheme, however, shall be carried out in three phases. The first phase is for the solution of the conflict between UPC and UFC. Now this is not a matter of one BOAL but of all the BOALs existing in the society. The second phase is the solution of the conflict between the internal and external effects of production. This conflict has more importance for the development of new technology and the discovery of new sources of energy. This second conflict also has a direct influence on the total utility of present and future generations. Therefore, the information system must point out the benefits of the external effects of production and their disutilities if they appear. Finally, the third phase solves the loading measure of the present generation for ensuring the material bases available to the future generation for achieving greater total utility with less effort and self-sacrifice.

Taking into account that PDM on the social level is complex because of its three phases of conflict situations, it is difficult, particularly in the second and third phase, to assign subjective prior probabilities to the states of nature which may occur. In this case, the self-manager should develop a suitable decision-making rule for minimizing the loss function /4/:

$$l(s, \theta) = |X(s, \theta) - X(s^*, \theta)| \quad (3)$$

where  $s^*$  is the optimal strategy for the state  $\theta$  under consideration, and  $X(\cdot)$  is the value of the outcome of the strategy.

### IV. CONCLUSION

PDM in the self-management society is dependent on the purely personal views of UPC and UFC. These personal, isolated views con-

tribute to incorrect decisions which essentially negatively react on social development. If the information system is more developed, however, then personal views will be of less importance. Therefore, it seems necessary to quantify PDM to be able to find out on which phase of PDM the personal, subjective views dominate and to be able to reject them.

In the BOAL, the quantification of PDM by Bayesian schemes points the way to the solution of the conflict between UPC and UFC. It also shows where personal, isolated views appear in PDM and the importance of the information system for eliminating personal interests in favour of collective ones.

The solution of the conflict situation on the BOAL level contributes to the optimal solution of the conflict between the internal and external effects of production and to the optimal solution of "the intergeneration problem".

Therefore, to enable the best social development, it is necessary to develop the information system on the BOAL level and on the level of PDM of social significance or social planning. By developing the information system, the self-management society prevents incorrect decisions in PDM and contributes to optimal social development.

1. Brus Wlodzimiers, *Socialist Ownship and Political Systems*, Routledge & Kegan Paul, London and Boston, 1974.
2. *Constitution of the Socialist Federal Republic of Yugoslavia*, Službeni list, Beograd, 1974.
3. Dyckman, T. R., Smidt, S., McAdams, A. K., *Management Decision-Making under Uncertainty*, Macmillan Company, London, 1969.
4. Hey, J. *Uncertainty in Microeconomics*, New York University Press, New York 1979.
5. Maksimović, I., *Lecture on the Yugoslav Economic System*, held in London School of Economics, London, 1979.
6. Marglin, S., *The Social Rate of Discount and The Optimal Rate of Investment*, *Quarterly Journal of Economics*, vol. 77, no. 1, 1963.
7. Masnikosa, V., Petrović-Lazarević, S., "Procedure for Finding the Suboptimal States of Multigoal Demands" Symposium Cemi-Pupin V., Tbilisi, 1978.
8. Petrović-Lazarević, S., "Self-Management Social Welfare Model" IV International Congress of Cybernetics & Systems, Amsterdam, 1978.
9. Petrović-Lazarević, S., "The Role of Information in the Process of Investment Decision-Making", *Informatica*, Bled, 1979.

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## NEKI ASPEKTI ZNAČAJA INFORMACIJA U PROCESU DONOŠENJA ODLUKA U SAMOUPRAVNOM DRUŠTVU

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### Re z i m e

Prema Ustavu od 1974. godine i Zakonu o udruženom radu u OOUR-u radni ljudi imaju pravo da odlučuju o raspodeli dohotka na lične dohotke i na fond akumulacije.

U robnoj privredi, kakva je privreda Jugoslavije, glavna kategorija u procesu donošenja ekonomskih odluka je samoupravljač koji se tretira kao proizvođač i potrošač istovremeno. Pojedinaac kao potrošač, težeći da realizuje maksimalnu korisnost tekuće potrošnje (UPC), odnosno kao proizvođač, nastojeći da ostvari maksimalnu korisnost buduće potrošnje (UFC), neminovno dolazi u konflikt u procesu donošenja odluka (PDM) u OOUR-u. Taj konflikt, nazvan konflikt između UPC i UFC, uspešnije se rešava, u smislu objektivnog donošenja odluka, ukoliko je samoupravljač bolje informisan o prednostima odlučivanja u korist UFC. Međutim, ako on nije svestan veze između UPC i UFC, ili, drugim rečima, ne uočava da maksimizacija UPC zavisi od maksimizacije UFC, odluka koju će doneti negativno će se odraziti na uspešnost poslovanja OOUR-a.

Da bi se donele optimalne odluke o konfliktu UPC i UFC nije samo potrebno biti dobro informisan, već je potrebno i pratiti tok PDM kako bi se moglo uočiti gde je subjektivni, izolovani stav doprineo pogrešno donetoj odluci. S tim u vezi, čini se da bi kvantitativna obrada PDM mogla biti od koristi. Otuda je u radu ukazano na Bayesian problem putem koga se utvrđuje očekivana korisnost za date strategije OOUR-a. Istaknut je značaj subjektivnih verovatnoća koje će manje odražavati čisto individualne stavove o prednostima i nedostacima date investicione odluke, ukoliko je samoupravljač primio više informacija boljeg kvaliteta.

U PDM »medugeneracijskog problema« ponovo se javlja konflikt UPC i UFC, ali se sada javlja, sa jedne strane, i konflikt unutrašnjih i spoljnih efekata proizvodnje, a sa druge strane, konflikt mere opterećenja sadašnje generacije u smislu obezbeđenja materijalne baze buduće generaciji da postigne veću ukupnu korisnost uz manje napora. Rešenje konfliktne situacije na nivou OOUR-a utiče na rešenje konflikta internih i eksternih efekata proizvodnje i rešenje »medugeneracijskog problema«.

Kako je PDM na nivou društva, odnosno na nivou donošenja odluka o »medugeneracijskom problemu« veoma složen, mogu se javiti teškoće određivanje subjektivnih verovatnoća, pa se za kvantitativno obuhvatanje PDM preporučuje minimizacija funkcije gubitka prema Hey-u.

Da bi se obezbedio optimalan društveni razvoj, potrebno je razvijati informacioni sistem koji doprinosi odstranjivanju ličnih, individualnih interesa u korist kolektivnih interesa. Razvijanjem informacionog sistema, samoupravno društvo se obezbeđuje od pogrešno donetih odluka u PDM i utiče na razvoj društva blizak optimalnom razvoju.