

THE FUNDAMENTAL PROBLEM OF SOCIALIST PLANNING¹

By MICHAEL ELLMAN

WE sometimes wrongly, without the necessary bases, blame gosplans, ministries and supply-marketing organisations for annoying misunderstandings, disproportions, losses in production and the violation of the interests of consumers. When one encounters so many people making mistakes, it is necessary to look for the reason not only in their individual qualities, but in that system, or more precisely in that 'theory', which conceives of planning as the management from the centre of an all-embracing extremely detailed nomenclature of commodities.

E. G. LIBERMAN²

(Lieberman, 1970, p. 74)

The problem with which this paper is concerned is as follows. According to Marxist-Leninist theory (as set out in scattered observations by Marx and Engels and as made explicit by Kautsky, Lenin, Bukharin, and Preobrazhensky, and Kritsman) the way to ensure that a socialist economy exhibits superior rationality to the anarchy of production prevalent under capitalism is for a national economic plan to be drawn up and subsequently implemented. Each person, guided by the internalized desire to achieve social rationality, will strive to carry it out in an efficient way. The forces of production will be organized rationally.

In the state socialist countries national economic plans are in fact drawn up. Nevertheless, it is well known that what the U.N. publications refer to as 'the centrally planned economies' are characterized by widespread waste and inefficiency. This has been well described in an extensive literature (Berliner, 1957, 1976; Kornai, 1959). What accounts for this dialectical disunity of theory and practice? The purpose of this paper is to argue that the fundamental cause is a theoretical one, the inadequacy of the theory of decision making implicit in the Marxist-Leninist theory of planning. The theory of decision making implicit in the Marxist-Leninist theory of planning is inadequate because it ignores the fundamental factors of partial ignorance,³ inadequate techniques for data processing, and complexity.

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² The same point has been made by Roberts. See Roberts (1971). The point has, of course, been argued for decades, at least since the time of Pierson (1902) if not of Gossen (1854).

³ This term is taken from Loasby (1976). It is preferred to 'uncertainty' because the latter is often used in a restricted, technical, sense in economics. The importance of partial ignorance for the theory of planning was discussed in the Polish and Soviet literature of the 1960s.

Partial Ignorance

If (as in some models) the central authorities had perfect knowledge of the situation throughout the economy (and also adequate techniques for processing it and transmitting the results) then they would be able to calculate efficient plans and issue them to the periphery. In fact the central authorities are partially ignorant of the situation throughout the economy and this is a major factor explaining the unexpected (from a Marxist-Leninist point of view) phenomena described in the literature.

For example, the problem of slack plans¹ arises from the fact that the necessary information is largely concentrated in the hands of the periphery, and the data available to the centre is heavily dependent on the data transmitted by the periphery. Since the social situation is not one in which the value of selfless work for the good of the community has been widely internalized, the problem of motivating people on the periphery to submit socially rational plan suggestions arises. (The actual situation is one in which officials strive to avert risk and avoid responsibility, and obedience to instructions from above is highly valued by superiors.) The fact that subordinate members of an administrative hierarchy are more interested in defending their own interests than in the general interest, and the failure of the authorities to reconcile fully the two, is a permanent problem of the administrative economy. It derives its importance from the inability of the central authorities to concentrate in their hands all the information necessary for the calculation of efficient plans and the complexity of the decision-making process (see below).

Similarly, the criterion problem largely results from the fact that the central authorities lack the information necessary to issue all the associations² with all-embracing plans and are only able to issue them with certain plan targets and certain criteria.

Similarly, some of the problems of personal consumption are a result of the partial ignorance of the central authorities. For example, the changes in the production plan of the Beloomutski clothing factory when it made the transition from production for plan to production for use (Ellman, 1973, p. 53), resulted not from any conflict between 'planners' preferences' and 'consumers' preferences', but from the fact that the planners did not know what the consumers preferred. That knowledge was concentrated in the hands of the distribution network.

Similarly, one of the reasons why the rationing of producer goods is a

¹ A slack plan is a plan which provides for less output than is possible, or more inputs than are necessary. Such plans are a common, and much discussed, feature of the 'centrally planned economies'.

² An 'association' is a body intermediate between a ministry and the enterprises. It corresponds in some respects to a firm.

cause of inefficiency is because the organizations that do the rationing are ignorant of where the goods would be of most value to the national economy.

Similarly with misallocating prices. If the planners had sufficient information and time to make socially rational decisions throughout the economy, and enterprises simply carried out their instructions, then the problem of misallocating prices would not exist.

Partial ignorance about the future is the main reason why the repeated attempts to calculate long-term plans have never led to more than the production of documents that speedily became irrelevant. After a short time it became obvious that the main current problems were not those considered in the plan.

The partial ignorance of the planners is of two types. First, ignorance which is created by the planning process. Secondly, ignorance which is unavoidable. The first type of ignorance has three causes. Subordinates may transmit inaccurate information, the process of transmitting information may destroy some of it, and the addressees of information may not receive it. Consider each in turn.

It is well known that in any bureaucracy (Downs, 1967, p. 77), 'Each official tends to distort the information he passes upwards to his superiors in the hierarchy. Specifically all types of officials tend to exaggerate data that reflect favourably on themselves and to minimize those that reveal their own shortcomings.' This explains such phenomena as the exaggeration of agricultural output figures, in the U.S.S.R. which Khrushchev criticized, and in China during the Great Leap Forward. It also explains the exaggeration of input requirements and the underestimation of output possibilities that is a normal part of the process of planning and counterplanning by which plans are drawn up. It is in order to deal with this problem that Soviet incentive systems are devised and altered.

The tendency by officials to distort the information they transmit upwards can be minimized in three ways, by strict supervision, by appropriate incentives, and by avoiding the need for the information. Strict supervision (by the party, a control commission, statistical and financial agencies) is a traditional method used in the state socialist countries to reduce information distortion. It is not without cost. Inappropriate incentives (for example, for plan fulfilment and overfulfilment) can generate distorted information, and alternative incentive systems can be experimented with. An example of avoiding the need for information was the gradual, and still partly experimental, replacement of the indent method of determining material requirements by mathematical methods in the Soviet Union in the 1970s.

An example of how the process of transmitting data may destroy some

of it is provided by the aggregation problem. During the process of planning there is aggregation by commodities, enterprises, and time periods. All three introduce errors (Ellman, 1969a). Aggregation errors can be reduced by following suitable aggregation criteria or by enlarging the detail of the plan, but are unlikely ever to be eliminated.

Another example of how socialist planning can create ignorance is provided by what the cognitive theorists of decision making refer to as 'the assumption of a single outcome calculation'. This refers to the fact that the decision-making process often 'does not match the uncertain structure of the environment in which events might take a number of alternative courses. Rather, it imposes an image and works to preserve that image.' Hence 'Pertinent information may enter the decision-making process or it may be screened out, depending on how it relates to the existing pattern of belief. . . . That information which is threatening to established belief patterns is not expected to be processed in a fashion wholly dominated by the reality principle' (Steinbruner, 1974, p. 123).

The classic example, of course, is Stalin's surprise at the German invasion of 1941, despite the advance information transmitted by Sorge and others, resulting from his screening out information that threatened an established belief pattern. Similarly, Gomulka was surprised at the outcome of his policy of self-sufficiency in grain, despite warnings by economists such as Kalecki of its likely adverse effects (Feiwel, 1975, chapter 19).

Not only may decision makers screen out accurate information, but they may also suppress its sources. For example, the reaction of the Polish leadership to discussion of the five-year plan, 1966-70, was not only to ignore the suggestions made (whose correctness was shown by subsequent events) but also to take 'exceptionally violent action' (Brus, 1973, p. 107) against the leading discussant. Similarly, one of the causes of the problems of Soviet agricultural policy between the wars was the screening out of accurate information about, for example, the size of harvests and of marketed output, and of the importance of proper crop rotations, and the suppression of the leading specialists in agricultural statistics and agronomy.

An important cause of avoidable ignorance in the state socialist countries has been the screening out of information provided by specialists (and sometimes their suppression) because the political leadership distrusted the specialists, regarded them as 'not our people' and politically unreliable.

Once accurate information has been screened out and its purveyors suppressed, reliance may be placed on people who are in fact not competent in the area concerned. As the Hungarian economist Jánossy (1969) has noted, the Stalin era was characterized not only by suspicion of

specialists but also by confidence in non-specialists. For example, in working out investment plans, reliance was often placed on engineers not competent in the area concerned, let alone in calculating and evaluating costs. As a result some extraordinarily expensive projects were designed and executed.

Moreover, once accurate information has been screened out, and its sources suppressed, an entirely fanciful picture of reality may play a major role in the perception of decision makers. This is especially easy if there is a strict pre-publication censorship of all publications and only material supporting the illusions of decision makers can be published. For example, it is well known that at the end of Stalin's life his policies were having a very negative effect on agriculture in the U.S.S.R. and throughout Eastern Europe. One reason for this is that, as Khrushchev pointed out in his report to the Twentieth Congress of the C.P.S.U. 'On the personality cult and its consequences', Stalin's perception of the agricultural situation largely derived from films which portrayed a quite illusory picture of rural prosperity. 'Many films so pictured collective farm life that the tables were bending from the weight of turkeys and geese. Evidently Stalin thought that it was actually so.'

A major feature of developments in the CMEA (i.e. Comecon) countries since the death of Stalin has been a reduction in the ignorance of decision makers. The publication of statistical data has been enormously increased. Numerous scientific research institutes have been set up and encouraged to undertake independent work. New, policy-related disciplines such as mathematical economics, sociology, and demography have been encouraged. The preparation and publication of original policy-related work has been encouraged. Genuine discussions have been held on policy questions (for example, the Soviet discussion of the 1960s about economic reform).

Nevertheless, the partial ignorance of the decision makers, which they themselves have created, may still play a major role in affairs, as Polish events have shown. In Poland in the 1970s attempts to increase the price of food have twice (February 1971 and June 1976) had to be withdrawn, as the authorities reacted to popular feeling. Their ignorance about likely popular reactions resulted from the non-existence of institutions for conveying the views of the workers to the leadership,¹ the unwillingness of subordinates to convey unpalatable facts to their superiors, the screening out by decision makers of unpalatable information and the suppression of those who provided it, and the centralization of decision making.

Some ignorance is just unavoidable. The nature of economic life is such that the economy is continually being effected by events that were

¹ According to the transmission-belt theory the function of trade unions is just the opposite. A partial substitute is provided by the state security organs.

not foreseen when the plan was drawn up. This is particularly obvious with respect to harvest outcomes, innovations either technological or managerial/organizational, international affairs, and demographic factors. This ignorance about the future can be reduced, for example by establishing institutes for research into the international conjunctural situation or demography, but it can never be eliminated. As Keynes (1937, pp. 213–14) observed, ‘the expectation of life is only slightly uncertain. The sense in which I am using the term is that in which the prospect of a European war is uncertain, or the price of copper and the rate of interest twenty years hence, or the obsolescence of a new invention, or the position of private wealth holders in the social system in 1970. About these matters there is no scientific basis on which to form any calculable probability whatever. We simply do not know.’ Keynes, of course, drew far-reaching conclusions from the importance of ignorance.

Not only are the central decision makers unavoidably ignorant, but the attempt to concentrate all the relevant information in their hands is costly. It is costly in two respects. First, because large numbers of people and considerable specialized equipment are required. Secondly, the erroneous view that social rationality can be attained by calculating a central plan which is then faithfully executed may reduce the responsiveness of the country to new information and hence generate waste. Lerner (1975, p. 214) has argued that

a distinguishing feature of a system with centralised control is a high degree of *rigidity* of the structure, because adaptation, to both random changes and changes caused by the evolution of the system and the environment, does not take part in the individual parts of the system but only in the central control point. Centralised control permits stabilisation of a system over a long period, suppressing both fluctuations and evolutionary changes in the individual parts of the system without reconstructing them. However, in the final analysis, this may be damaging to the system because contradictions between the unchanged structure of a system and changes associated with evolution increase to global dimensions and may require such a radical and sharp reconstruction as would be impossible within the framework of the given structure and would lead to its disintegration.

Similarly, Beer (1969, p. 398) has noted that ‘Adaptation is the crux of planning, although it is not its ostensible object. The ostensible object of planning—a realized event—happens from time to time as a fall-out of the planning process which passes it by. The real object of corporate planning is the continuous adaptation of the enterprise towards continuing survival.’ Because of partial ignorance ‘large organisations, if they are to prosper, may have to reject determinism in favour of free will. Delegation may be used, not to programme choice, but to encourage initiative. Amid the uncertainties and chances of war, the initiative, or lack of it, shown by subordinate commanders has often proved decisive. Nelson both demonstrated such initiative as a subordinate and fostered it as a com-

mander; and Slim, rating as "one of my most helpful generals" the Japanese commander at Kohima who missed a great opportunity by conforming to his orders, praised his own subordinates for their ability to "act swiftly to take advantage of sudden information or changing circumstances without reference to their superiors" (Loasby, 1976, pp. 136-7).¹ The assumption that all relevant data has already been processed at the centre and that the duty of all subordinates is to carry out the plan may simply result in wasteful and socially irrational responses to the changing situation because subordinates are barred from socially rational responses and the centre lacks the information.²

A major weakness of the Marxist-Leninist theory of planning (and of the institutions based on that theory) is that it fails to take any account of ignorance, despite its fundamental importance. It also fails to take account of stochastic, as opposed to deterministic, processes. It assumes a perfect knowledge, deterministic world, in which unique perfect plans can be drawn up for the present and the future. In fact we live in a world in which we are partially ignorant about the past, present, and future, and in which stochastic processes are important, and our theories, institutions, and policies must take account of this. In this respect the Marxist-Leninist theory of planning suffers from the same weaknesses as neo-classical price theory.³ This may be ironical, but it is scarcely surprising, since both are nineteenth-century theories which ultimately derive from classical physics, a theory in which ignorance and stochastic processes play no part, and whose success turned it into an extraordinarily influential research programme. The Laplacean demon has long been expelled from physics. It is time to exorcize him from economics too.

Inadequate Techniques for Data Processing

The time has not yet come when the giant computing machines of the Central Planning Board, supplied with all the necessary information by the Central

¹ The quotations are from Slim (1956), pp. 311 and 542.

² As Crozier (1964, p. 190) has observed, the result of the decision-making process that characterizes bureaucracies is that the 'People who make the decisions cannot have direct first-hand knowledge of the problems they are called upon to solve. On the other hand, the field officers who know these problems can never have the power necessary to adjust, to experiment and to innovate.' The Maoists were very much concerned with overcoming both these problems. To give the cadres direct first-hand knowledge of the problems, they used cadre participation in manual labour and sending down. To give the field officers the necessary power, they transferred to them considerable authority to implement control policies.

³ The reason why believers in contemporary neo-classical theory subscribe to the view (Hahn, 1974, p. 37) that 'the Government can in principle always do as well and often better than the market' is because the model they analyse, like the Marxist-Leninist one, is a deterministic one which takes no account of the fundamental factors of partial ignorance, inadequate techniques for data processing, and complexity, and hence is unable to discuss the real advantages of markets from an efficiency point of view, dispersal of initiatives, and simplicity. (For examples see Ellman, 1969b, pp. 342-3.) Recent empirical work on the technology gap and innovation in Soviet industry has emphasized the importance of dispersal of initiatives for technical progress.

Statistical Office, can take over from where the mechanism of the market system has left off.

W. LEONTIEF

(Leontief, 1971, p. 20)

The inadequacy of the techniques used to process such data as are available is the main reason for the instability of the plans and one of the reasons for the long construction periods. The planning techniques currently used (material balances and input-output) are such that the current plans are always inconsistent (Ellman, 1973, chapter 1). As the inconsistencies come to light during the planned period, it is necessary to alter the plan so as to allow the economy to function. A typical example of an inconsistency leading to the alteration of a plan is the impossibility of fulfilling a plan because of the lack of a necessary input. When the production plan affected is that of a construction site then this naturally delays completion of the project.

This problem can be dealt with, to some extent, by improving the planning techniques. For example, a major innovation in investment planning in Eastern Europe in 1960–75 was the calculation of optimal investment plans by means of linear programming and related techniques. This was an improvement in planning techniques because the investment plans drawn up in this way were more likely to be feasible than those drawn up by the traditional methods. The latter were often not feasible, which is one of the explanations of the chronic long construction periods. This new technique also gave the possibility of doing variant calculations. For example, when the 1976–90 plan was being worked out in the U.S.S.R. it was decided to compile the optimal plans for the development of each industry in four variants. Two variants differed according to the value used for the norm of investment efficiency, and two according to the volume of consumption assumed. In this way it was possible to study the sensitivity of the optimal location and output decisions to variations in the key parameters. Although this new technique was an improvement on the old one, its use was far from sufficient to ensure the calculation of efficient plans. Problems with the new technique included the insufficient availability of the necessary data, the unrealistic nature of some of the assumptions (e.g. constant returns to scale), the need to coordinate the calculation of optimal plans for all the industries with each other and with the macro plan variables, and the fact that the results of the calculations were often not accepted. The improvement of techniques is a continuous process in which further improvements can always be made.

It sometimes happens that major innovations in planning techniques about which high hopes are held, simply fail to achieve the objectives of those who introduce them. For example, during the 1960s input-output

was widely introduced in planning in the CMEA countries. It was the first mathematical technique to be introduced in socialist planning, and high hopes were held by many about the benefits that would flow from using it. It was widely expected that it would eliminate the problem of inconsistent plans because the use of input-output enabled consistent plans to be calculated. In fact this turned out to be erroneous. Input-output, like material balances, is quite unable to resolve the problem of drawing up consistent plans for all the centrally planned commodities. This did not mean that the new technique was useless. On the contrary, it turned out to be very useful for the calculation of pre-plan variants. The problem it had been introduced to solve, however, remained unresolved.

Not only may new techniques fail to solve the problems they were introduced to solve, but experiments with them may simply underline the losses caused by the use of administrative methods. A well-known example was provided by the use of linear programming in the 1960s in the U.S.S.R. to calculate minimum cost transport schemes.¹

The main reason why China makes extensive use of indirect centralization, rather than the more orthodox direct centralization, appears to be that it is such a huge country with an enormous population, most of it engaged in agriculture, and with very limited accounting and statistical personnel.² Under these conditions, the partial ignorance of the authorities and the inadequate techniques available for data processing are such that imperfect direct centralization would be very inefficient.³

¹ 'This is not a complicated task. Many articles and books have been written and not a few dissertations defended, but almost no freight is shipped by the optimal schemes. Why? Simply because the transport organisations are given plans based on ton kilometres. One can establish computer centres, and conceive superb algorithms, but nothing will come of it as long as the transport organisations reckon plan fulfilment in ton kilometres' (Belkin, 1964).

² The indirect centralization in China differs from that widely discussed in Eastern Europe in the 1960s, in that the former is largely via the political process (party, army, and media) and the latter via prices and other value relations (e.g. profit, rent, and the rate of interest). ('Indirect centralization' describes a decision-making process in which decision making is devolved from the centre to lower levels but the economic system is so designed that the decisions made are those that would have been made by the centre had the centre the information and time to make them.)

³ Even for such a basic statistic as the total population there are simply no reliable figures. It is not that the authorities have accurate data but do not release it. It is simply that the authorities themselves lack the information. In 1971 Vice-Premier Li Hsien-nien stated (Ashbrook, 1975, p. 35) that 'Some people estimate the population at 800 million and some at 750 million. Unfortunately, there are no accurate statistics in this connection. Nevertheless, the officials at the supply and grain department are saying confidently, "The number is 800 million people." Officials outside the grain department say the population is "750 million only", while the Ministry of Commerce affirms that "the number is 830 million". However, the planning department insists that the number is "less than 750 million".' The Ministry of Commerce insists on the bigger number in order to be able to provide goods in large quantities. The planning men reduce the figure in order to strike a balance in the plans of the various state departments.'

Complexity

One of the rarely mentioned economic wastes of Soviet-type command systems has been this destruction of *élan vital*, a production input for which there is no close substitute.

V. HOLESOVSKY
(Holesovsky, 1968, p. 547)

Complexity is used here to describe the fact that decision making is dispersed over numerous individuals and organizations. The dispersal of decision making is a normal and necessary reaction to the difficulties of collecting and processing in one spot all the data necessary for rational decision making. It creates, however, numerous problems.

One of the reasons for the inconsistency of the current plans, which in turn is a major cause of their instability, is precisely that the planning of production and supply for the entire national economy is regarded as too complicated for any one organization, and accordingly is split up among many organizations. This creates numerous coordination problems (Ellman, 1973, pp. 24–5).

Similarly, the fact that planning, in the sense of the compilation of plans and checking up on their fulfilment, is split up in the U.S.S.R. between two organizations, Gosplan, the State Planning Committee, and TsSU, the Central Statistical Administration, has traditionally created problems for Soviet planning. For example, the introduction of input-output into Soviet planning in the 1960s was hindered by the fact that the two organizations used different commodity classifications.

The fact that decision making is dispersed ensures that it will be effected by what Downs (1967, p. 216) has called the Law of Interorganizational Conflict. This states that *Every large organization is in partial conflict with every other social agent it deals with.*

The Marxist-Leninist theory of planning assumes that all the decision makers in an economy form a 'team', that is a group of persons working together who have identical goals. In fact the decision makers form a 'coalition', that is a group of persons working together who have some, but not all, goals in common.¹ An example of the results of this is that in the U.S.S.R. subordinate organizations (ministries, local party committees) often begin the construction of plants the building of which is in their interest (because it makes them less vulnerable to the behaviour of other organizations, or increases the output of 'their' product) even though the initiation of such construction projects may slow down other construction projects and have a negative effect on national goals. This is a normal phenomena in the state socialist countries and one of the explanations of the chronic long construction periods.

¹ This was extensively discussed in the Czechoslovak literature of the 1960s.

The fact that decision making is dispersed between organizations which have some, but not all, goals in common, creates the need for higher-level bodies to guide lower-level ones to socially rational decisions, i.e. the criterion problem.

It is because decision makers form a coalition and not a team that incentives, both negative and positive, moral and material, play an important motivating role in ensuring the necessary output of work. Of course there are certain groups of the population that may work well to meet national requirements independently of their own material rewards. 'There can be no doubt that on the highest level of Cuban political leadership and economic management, as well as on other levels, including the lower ones of educational, scientific, medical and artistic activities, true inner dedication to the interests of the community does, in fact, prevail. In most instances, moreover, it is combined with a deeply ingrained "instinct of workmanship"'. The Cuban programs of health, education and social welfare seem major accomplishments, especially in view of the limited resources available for investment in them' (Leontief, 1971, p. 22). Nevertheless, the whole experience of the state socialist world indicates that motivating people to work well to achieve the goals laid down in the national plan is a complex and difficult issue which has not so far been solved in an entirely satisfactory manner anywhere. From an analytical point of view the whole problem only arises because, contrary to Marxist-Leninist expectations, many people even in economies where the means of production are nationalized and there is a national economic plan are guided not by an internalized need to fulfil the plan, but by other motivations, or, in other words, they constitute a coalition and not a team. The failure to motivate adequately the labour force was the main cause of the falls in labour productivity in Cuba in the 1960s, in Soviet agriculture in the aftermath of collectivization, and in Chinese agriculture in the aftermath of the Great Leap Forward. In fact it has been an important source of waste throughout the whole history of state socialism.¹

An important criterion for officials in any organization is risk aversion. Risk aversion is one of the explanations both of bureaucratization and of the failure of the incentive system introduced in the Soviet economy as part of the Kosygin reform of 1966–9. Why risk aversion is one of the causes of bureaucratization has been well described by Downs (1967, p. 100). In order to avoid the risk of making a decision that might subsequently be criticized, officials often rely mainly or wholly on the established rules and regulations. This may generate 'red tape' and socially

¹ U.S. firms engaged in technology transfer to Poland and Romania regard it as characteristic of those countries that (Hayden, 1976, p. 108) 'worker morale and initiative [are] close to non-existent'.

irrational decisions, but it is likely to provide the relevant official with a satisfactory answer in any subsequent inquiry.

As for the failure of the Kosygin reform of 1966–9, 'It is easy to see that for risk averting enterprise management even under the reform plan underfulfilment and an increase in the plan are assymetrical. The loss from each one per cent of underfulfilment (reprimands, inspection by higher bodies, loss of managerial bonuses, reduction in the enterprise incentive funds) is much greater than the gain from each one per cent by which the plan is increased (30 per cent or more of the marginal increments to the enterprise incentive funds and marginal increments to the managerial bonuses). Hence risk aversion is another reason why the new system failed to lead to the universal adoption of taut plans' (Ellman, 1977, p. 33).

The fact that decision making is dispersed among a coalition, whose members are not allowed, in many cases, to charge for their output, is one of the causes of bureaucratization. The reason for this is that it brings into operation what Downs (1967, p. 188) has termed the Law of Non-Money Pricing. This states that *Organizations that cannot charge money for their services must develop non-monetary costs to impose on their clients as a means of rationing their outputs*. Hence much of the irritating behaviour of bureaucrats often represents means of rationing their limited resources so that they will be available to those truly anxious to use them. It is precisely because non-market organizations tend to breed bureaucratization that there is so much stress in the CMEA countries on commercial accounting (*khozraschet*) and, during the 1970s, in the U.S.S.R. numerous chief administrations of ministries were transformed into industrial associations based on commercial accounting.

Risk aversion and localized criteria are important factors hindering technical progress. Innovation is hindered by a system in which quarterly plan fulfilment is so important and where external effects of the innovation are of little importance to most decision makers.

The importance of the dispersal of decision making in ensuring that even a state-owned non-market economy would not necessarily be socially rational, was familiar already to acute observers of War Communism. More than half a century ago, Kritsman (1924, p. 116) observed that 'If we consider the economy as a whole . . . we come to the conclusion that in our proletarian-natural economy *exploitation and the market were overcome without overcoming the anarchy of economic life*. . . . As is well known, commodity economy is anarchic economy. It would, however, be incorrect to conclude from this that a non-commodity economy, i.e. a natural economy, is necessarily a non-anarchical, i.e. a planned, economy. . . . For an economy to be anarchic it is necessary and sufficient for there to be a

multiplicity of (independent) economic subjects.' With the advantage of half a century's experience we can add to Kritsman's observation the twin points, that the dispersal of decision making is inevitable and permanent (because of partial ignorance and inadequate techniques for processing information), and that an economy with dispersal of decision making may be, but is not necessarily, socially irrational.

Conclusion

The fundamental reason for the wastes and inefficiencies of the administrative economy is theoretical, namely the omission from the Marxist-Leninist theory of planning of some essential aspects of reality. They are, partial ignorance, inadequate techniques for data processing, and complexity.

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