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**QUANTITATIVE ECONOMICS OF SOCIALISM : INPUT-OUTPUT APPROACHES** (Economic Research Series No. 27, Institute of Economic Research, Hitotsubashi University) By *Masaaki Kuboniwa*. Tokyo : Kinokuniya co. and Oxford University Press, 1989, viii + 278 pp. ¥4,600.

Professor Kuboniwa is well-known among Japanese economists for his mathematical works on the Soviet economy and for his computational approaches, as well. I would like to say that this book is notable for the high level theoretical and mathematical approaches that are presented. This book will become a center of academic attention in Japan and abroad.

The volume begins with a sketch outlining the historical background behind Soviet mathematical economics. In this sketch are presented a general concept of his approaches and characterization of each chapter.

He provides five historical stages as follows : (1) the Heroic Period (1920's), (2) the Purge Years (1929–1953), (3) the Economic Renaissance (1954–1968), (4) the Attempted Computerization (1969–1985), and (5) Perestroika (1985–). He points out that there existed distress as well as glory on this course. Indeed, in their struggle for recognition of mathematical approaches, Soviet economists were obliged to pass through a variety of barriers of Stalinism : Stalin condemned as a “game with figures” their pioneering approach — application of ‘balance’ developed by TsSU — to the national economy. Stalin ordered that statistical data be put under strict control in case of their use and publication. In spite of those difficulties, it has produced a large number of excellent scholars like Novozhilov and Kantorovich, a Nobel prize winner, who are independent pioneers of the ‘shadow price’ theory and the simplex method for linear programming.

Also interesting is the fact that the attempted computerization, writes Kuboniwa, helped to justify centralized economy which is unfavorable for the development of market relations. This irony tells us that information networking (computerization) should be combined with an income incentive system (one of the market functions) and a sufficient amount of correct statistical data, both of which were not obtainable in those days.

The following chapters provide various mathematical topics which Kuboniwa has studied for many years : Chap. 2 covers “Basic Theory of Optimal Planning and Pricing” ; Chap. 3 provides “Stepwise Aggregation for Material Balances” ; Chap. 4 provides “Stepwise Aggregation for Optimal Planning” ; Chap. 5 details “Input-Output Structures of Soviet and East European Economies : a Comparative View” ; Chap. 6 also details “Input-Output Analysis of the Structure of Soviet and East European Foreign Trade : a Comparative View” ; Chap. 7 includes “Applying Turnpike Models to the Soviet Economy” ; Chap. 8 discusses “Prospects for Restructuring the Soviet Price and Finance System” ; and the Appendix contains “Derivation of U. S. Commodity-by-Commodity Input-Output Tables from SNA Use and Make Tables”.

All of these topics are closely related with the most up-to-date research objectives. Therefore, readers are recommended to use this book as an excellent map wherein are contained his creative theoretical reference-analysis of relevant topics, and useful economic information. For example, providing the “skyline” chart of input-output analysis, Kuboniwa points out ten sectors of lowest self-sufficiency rates (in 1972 USSR), in which are included machinery and equipment sectors like ‘Printing M & E’, ‘Logging & Paper M & E’, ‘Casting M & E’ (p. 163), which are considered as favorable export items for western countries from a viewpoint of foreign trade. Another strong point of this book is the chapter on the new price structure under newly introduced pricing principle (which I will discuss later).

It is obvious that main structure of Koboniwa's research consists of optimizing theory (L-P analysis), interindustry transaction table analysis (I-O analysis) and price-formation theory under socialism as one type of application of these two theories. When Perestroika is referred to, the particularly interesting topic among his arguments in this book is "Prospects for restructuring the Soviet price and finance system" (Chap. 8).

One of the crucial tasks to ensure success in the economic reform is a drastic reform of the price-formation principle now employed. However, there exists a notorious distortion of price structure in the Soviet Union, which forces lower rates of added value on production goods and higher rates of added value on consumer goods. The distorted price system has been produced by agricultural subsidies, housing subsidies, as well. And these subsidies and gigantic expenditures for defense have a big burden on the Soviet national finance. However, there exists another imbalance between the growth rate of labor productivity and wages. Because of this imbalance, an obstinate inflation is now becoming a big threat for the Soviet economy. Moreover, the Soviet ruble is not endowed with convertibility into hard currency. Nor does the ruble's official exchange rate reflects its own buying value.

Without eliminating the distortion, imbalance and false exchange rate of rubles, they can neither keep an effective economic system, nor implement an effective resource allocation. Nor can the Soviet economists identify the comparatively advantageous industries in the world market.

In Chap. 8, Kuboniwa examines in detail the mathematical prescription relating with the price problems proposed by the scholars of the Central Economic Mathematical Institute (TsEMI). Their prescription is one type of application of the optimal price (marginal cost) formation principle mainly to the extraction industries in which are included metal ore and coal mining, crude petroleum extraction and natural gas industries. The TsEMI scholars have suggested that the price level of the extraction industries should be raised considerably by switching the price formation principle from average-cost-base pricing to marginal-cost base pricing, whose measures are capable of strengthening the price incentive function and the resource saving function, as well.

Based on the author's explanation, we can summarize the concept of the price system proposed by the TsEMI specialists as follows : (1) they consider more advantageous the "self-financing" principle (profit is calculated by 'wage including social security cost + portion proportional to average net investment coefficients [k]', or 'amortization + profit = investment + other expenditure' than the 'production price' (the secondary portion of profit consists of the portion proportional to the average capital stock coefficients [F] instead of [k]). (2) the specialists suggest that the new concept of pricing called 'hybrid' price system is as follows : (a) marginal pricing principle is applied to sectors which produce primary, intermediate goods, in which are included iron ore, coal, gas, crude petroleum, lumber and agriculture sectors ; (b) pricing in other sectors is based on sector average price indices ; (c) both should be applied to 'self-financing prices' instead of 'production prices'. (3) the specialists propose the 'two channel' price system ( $p = pA + w + \alpha k$ ).

Kuboniwa says that the 'self-financing price' system "may be associated with imbalanced growth while the 'production price' system is associated with balanced growth" (p. 213). In my opinion, the 'self-financing price' system should be considered more desirable for effective resource allocation than the 'production price' system. The reason is that the 'self-financing price' system is capable of implementing selective investment corresponding to demand through fluctuation of prices.

As a result of their trial computation, the TsEMI scholars propose the 'Soviet Price Index

System (Table 4, p. 217). According to this table, as in (1), the price level of crude petroleum, gas, lumber, grain, coal, construction materials, etc., increases by about two times (crude petroleum — by three times), and others by about 1.02–1.6 times. Only light industries (e. g., textile) decreases by 2%.

Apart from the author's argument, I would like to express here my own opinion on the pricing system. Under the new condition of the complete self-financing accounting system, whether good or bad, any enterprise is required to pursue profit maximizing criteria. The price fluctuation should be theoretically free, corresponding to supply and demand (except for transition period). And if there is established a free competition among a large number of enterprises, and at the same time the market is pure (if given a price for enterprises, then  $p = MR = MC$ , here MR means marginal revenue and MC marginal cost), then the behavior of enterprises concerning the decision-making on product quantity is almost automatically determined at the point of maximizing the profit, namely, at the point of  $p = MR = MC$ , which guarantees not only maximum profit of enterprises but also an effective allocation of resources on a nation-wide scale. Under these circumstances, it is noticeable that in extraction industries there prevail sector-marginal-prices while in the other industries there are dominant sector-average-prices through price and market mechanisms which are free from any artificial control. Therefore, it is not necessary to consider marginal or average pricing.

I believe that there is no contradiction between the approach proposed by TsEMI and my above-mentioned approach judging from the final outcome, though both approaches are quite different : one starts from another's goal. However, it is important to compute the price structure, utilizing the 'hybrid' price principle because the computation provides us a fine perspective of the price-structure-changes. In order to enlarge the theoretical coverage, specialists are required to argue about cases of cost-decreasing industries (natural monopoly or public utilities) as well as cases of cost-increasing industries referred to in this book (see Fig. 1, p. 205.)

Finally, I would like to conclude that this book is a milestone of which Japanese economists in this field are proud. This volume can be appreciated as an important starting basis for economists who are approaching the Soviet economy from the aspects mentioned above.

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