PRIKAZI ČLANAKA — REVIEW ARTICLES

ECONOMIC ANALYSIS AND WORKERS' MANAGEMENT, 4, XXV (1991), 427—432

FIRST MATHEMATICAL HISTORY OF ECONOMIC THOUGHT*

*Branko HORVAT***

With a delay of several years I had an opportunity to read a pioneering book by Hans Brems which so far remained somehow unnoticed. Written clearly and concisely with simple mathematics, it reads like a novel. At any rate, I did not leave it until I read it through in a couple of days.

I

Economics is a measurable, quantitative science. It deals with magnitudes: quantities and prices. It also analyses qualitative changes which can be measured by means of ordering (greater or less), positive and negative signs and transformations (wealthy and poor countries in per capita income, social indicators of health, education etc.). Therefore, economics is a mathematical science. But it is also a philosophical (moral, as Adam Smith and nineteenth century British economists would say), unmeasurable social science. These two traits make economics extremely complex and difficult (if it is serious) and easily vulgarized (if it is not).

Since mathematics needs rigorously defined concepts and clear and absolutely consistent structure of analysis, it is natural that the development of mathematical economics lagged behind the development of verbal economics. Besides, adequate mathematical tools were not available. First textbooks on calculus became available around the middle of last century. That is why the mathematician Cournot, who wrote earlier, was not read and was discovered only around 1870, when calculus began to be applied in the neoclassical theory Perron-Frobenius theorems, without which linear models are unthinkable, became available in 1907—1912. The journal *Econometrica* was

---

* Hans Brems, *Pioneering Economic Theory, 1630—1980, A Mathematical Restatement*, Baltimore: Johns Hopkins Univ. Press, 1986, 411 pp.

** University of Zagreb.

started in 1933. but consistent estimates of systems of simultaneous equations became possible only after the work of Trygve Haavelmo during the Second World War. At about the same time linear programming was discovered. General equilibrium theory needed the discovery of fixed points in algebra. After the war, national and international statistical agencies began to collect necessary empirical data. And without data, empirical measurement is impossible and theory is largely sterile.

The history of mathematical economy would, thus, be rather brief. However, to write such a history was not the intention of Hans Brems. He points out correctly that even such economists as Cantillon or Ricardo, who produced verbal theories with a few numerical illustrations, in fact reasoned mathematically. And this is true of every important economic theorist. Marx wrote essays on calculus for himself (although he never used mathematics in published texts) and Schumpeter probably did not "ever cross the Atlantic without spoiling the trip by taking along a book on tensor calculus or partial differential equations" — as his pupil Samuelson remarked. Now, if reasoning is mathematical, it can be restated in mathematical symbols and equations even if the author does not use them. Such a restatement undertook Brems. We know, of course, that every logical statement can be expressed in mathematical symbols. Mathematics is, after all, a language *sui generis*. But that is not the point. What Brems implied is that mathematical restatement of verbally formulated theories makes them more consistent and easier to grasp; they are more sharply outlined and errors are more easily noticed.

That economics is mathematical is not a new discovery. Theories of several economists — Quesnay, Ricardo and Marx are well known examples — have been mathematically restated on numerous occasions. What is new is an attempt to restate the entire development of economic theory in this way. Brems was first to do that. The exposition is suddendly shortened and made more concise, the main ideas stand out more clearly and one gets the feeling of the direction of general development. In this sense the book has great didactic value and is indispensable as a teaching material for courses in the history of economic thought. However, for the full understanding of the underlying ideas, the book should be supplemented by a verbal exposition, such as that of Schumpeter, and by a general social and economic history, both expressing the second, "moral", dimension of economics.

As to mathematical formulations, they are admirably clear and simple. Brems is very careful not to skip the intermediate steps in mathematical deductions, which is a rather annoying practice in current writing. Therefore, the text is easily readable. The original formulations of the authors are usually clumsy, unnecessarily complicated and difficult to understand. Later, it proves possible to simplify them considerably, while preserving everything essential. Brems does exactly that using the high school mathematics. Still, to my taste he unnecessarily restricted his restatement. Apart from calculus, the contemporary economist is supposed to know linear algebra as well.

Therefore, matrices and other algebraic tools should have been used freely. That would have made possible not only generalizations but also would have made the exposition more elegant and, occasionally, simpler.

II

First attempt is bound to contain many lacunae and have other shortcomings. I shall mention some of them, hoping that the next editions of the book will eliminate them. My remarks fall into two categories; the first is concerned with what seems to me to be mistaken statements and the second refers to omissions. Let me start with the former.

On p. 221 Brems writes: "By contrast, after the Second World War neither West Germany nor Japan questioned capitalist principles and proved capable of repairing the massive damage sooner and more completely than did communist regimes imposed by conquest in Eastern Europe." That is simply not empirically true. For example, Yugoslavia was more destroyed than either Germany and or Japan, "questioned capitalist principles" and was sooner rebuilt than either of the two. Besides, Germany benefited from Marshall Plan and Japan was essentially a planned economy both of which is not exactly what is understood as "capitalist principles." In other words, reality is much more complex than desribed.

On p. 259 we read: "...where producers' goods are not subject to private ownership there can be neither private demand for them private supply of them, nor a *market price*" (italics mine). This is the old Mises-Hayek thesis which is patently wrong. Public corporations in Britain, France and elsewhere belie it. Apart from government and private ownership there is also cooperative and social ownership and all of them are compatible with the market. What is necessary for the market price to appear and function is the existence of the legally independent transactors (firms), not a particular type of ownership.

Two pages later an explanation for the emergence of the growth theory is offered: "After the turmoil of the Great Depression and the Second World War followed a quarter-century of almost steady growth. Soon economists began to theorize about long-run growth..." This is only partially true. Growth theorizing began earlier and for different reasons. In the 1920s the Soviet economist Fel'dman[1] began to construct growth models. His work was not followed and was rediscovered by Evsey Domar, himself of Russian origin, in the 1950s.[2] Independent theoretical beginning was made by Harrod in 1939. Then during the war Rosenstein-Rodan writes his famous article on the industralization of Eastern Europe.[3] He is immediately followed by Kurt Mandelbaum (Martin) who speaks of underdeveloped areas.[4] After the war everybody was engaged in planning, particulary as applied to countries which lagged in development. In 1952 and 1954 two other celebrated articles appeared, those of Artur Lewis.[5] Lewis constructed a model of dual economy. A year later Lewis published a

In conclusion, this is an admirable book and a pioneering one. But at the same time, there is a plenty of scope for improvements in the next editions.

REFERENCES

1. G. A. Fel'dman, "K teorii tempov narodnogo dokhoda", *Planovoe khoziajstvo*, 1928, № 11, 146—70.
2. E. Domar, *Essays in the Theory of Economic Growth*, New York: Oxford Univ. Press, 1957.
3. P. Rosenstein-Rodan, "Problems of Industrialization in Eastern and South-Eastern Europe", *Economic Journal*, 1943, 202—11.
4. K. Mandelbaum, *The Industrialization of Underdeveloped Areas*, Oxford: Blackwell, 1945.
5. A. W. Lewis, "Economic Development with Unlimited Supplies of Labour", *Manchester School*, May 1952 and 1954, 139—91.
6. A. W. Lewis, *The Theory of Economic Growth*, London: Allen and Unwin, 1955.
7. B. Horvat, *Radna teorija cijena (The Labour Theory of Prices)*, Beograd: Rad, 1987; "The Pure Labour Theory of Prices and Interest", *European Economic Review*, 1989, 1183—203.
8. P. C. Mahalanobis, "Some Observations on the Process of Growth of National Income", *Sankhya*, 1953.
9. M. Morishima, *Marx Economics. A Dual Theory of Value and Growth*, Cambridge: University Press, 1973.
10. M. Shechan, "Why Ramsey Pricing is Wrong: The Case of Telecommunication Regulation", *Journal of Economic Issues, 1991*, 21—32.
11. A. S. Eichner, ed., *Why Economics is not yet a Science*, London: Macmillan, 1983.