János Kornai's Leontief Lecture

LEONTIEF, MATHEMATICAL PLANNING: DREAMS AND REALITY

Leontief Medal Ceremony, St. Petersburg, February 13, 2010

Mr. President, Ladies and Gentlemen, Dear Friends and Colleagues!

I feel greatly honored to attend this ceremony and receive such a prominent recognition as the Leontief Medal. I am really touched by your beautiful words about my work, thank you all.

I first came across Leontief's name 53 years ago and it has had a strong resonance for me ever since. I read two articles in Hungarian in 1957-1958 – one by three authors: Kenessey, Németh, Szakolczay[1], and the other by András Bródy[2]. They explained what the Leontief Model meant. I was immediately impressed by its clarity, the beautiful simplicity of the square tables, and the symmetry and transparency of the Input – Output Model. This admiration towards Leontief's analytical tool has remained in my mind since then.

I recall my memories of a group of young researchers I belonged to. We liked to call ourselves mathematical planners. I was 29 years of age at the time. At the beginning there were only a handful of us, but later more and more scholars joined us. We formed various groups regarding our methods within the research program of mathematical planning. One group was mainly engaged in the theory and in the practical application of the I-O Model properly, the other used mainly Linear Programming and Activity Analysis, yet another worked with the Normal Growth Model, and there were the econometricians, too.

There was a healthy controversy and competition among these groups, but there was a strong cohesion as well. Let me explain briefly what the source of these cohesive forces was. In the late 50s, early 60s, after listening for a long time the mostly wrong and misleading empty phrases of the teachers of „polit-econ" many of us felt that a shift towards the economic reality was needed. This meant a higher respect for the statistical figures. Hard data became very important. Leontief's main message, his often repeated warning was: Respect data!

A second cohesive force was a shift of the tasks. Instead of the biased ideological polit-econ propaganda taught at universities and at party seminars we aimed at a shift towards

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[1] Kenessey, Zoltán, Nemény Vilmos and Szakolczay György (1957): „A ráfordítás-kibocsátás (input-output) elemzés" (Input-output analysis). *Statisztikai Szemle*, pp. 23-48 and 186-212.

[2] Bródy, András (1958): „Az ágazati kapcsolatok mérlegnek elméletéhez" (On the theory of the input-output table). *Közgazdasági Szemle*, pp. 823-836.

practical application. We tried to use models for practical analysis to serve economic decision-makers and planners.

Many of us there felt a third cohesive force. Mathematical planning provided a new, neutral, technical language. Though we were influenced by the thoughts of contemporary Western economics, we were not allowed to use its vocabulary in our written texts. The language of the so-called bourgeois economics, was one of the taboos. We could, however, use the neutral, technical language of mathematics, as the censors and editors did not understand it.

To sum it up, mathematical planning was not only a school of thought, in fact, it was more than that: it was an intellectual movement. It had a great educational impact on a whole generation. I write about it in details in my Memoirs.[3] I only know the Hungarian story closely, but a similar development went on in Poland, Czechoslovakia and in the Soviet Union. Great names like Kantorovich or Nemchinov come to my mind; then I can mention a younger generation (younger at the time…), like Makarov, Polterovich, Volkonsky and many others. They were all colleagues and friends of the Hungarian school.

Having discussed the nature of the school of mathematical planning, let me mention some of its tangible results as well. The Central Statistical Offices started to compile Leontief I-O tables regularly. The planning offices and ministries began to apply mathematical models.

Let me take a personal note here. I first met my wife, Zsuzsa, when I worked on an I-O model for the textile industry. She worked for the Central Statistical Office at the time, where I had to go to consultations. This was how we met for the first time. Then I saw her again presenting a talk at an international conference on the Leontief Model. Not much later I met her again at a seminar addressed by Wassily Leontief himself at the university of economics. Soon after our friendship began. Had it not been for Leontief, I might not have married her!

Let us turn back to economics now. At a certain point the enthusiasm for mathematical planning began to fade. There are several reasons for this disappointment.

First of all, there were serious difficulties with computing. Computers at the time were not so powerful as today. It was almost impossible to solve very large equation systems, especially in Eastern Europe. This aspect of difficulty has disappeared by now. It was only a transitional, temporary problem. Today computers are perhaps a thousand times more powerful than back in the 60s.

A more persistent problem was the unreliability of data. In the process of planning forecasts are compiled by experts employed by a company or a ministry to claim for

[3] Kornai, János (2006): *By Force of Thought*. Cambridge, Massachusetts: MIT Press.
In Russian: Яанош Корнаи (2008): *Силой мысли*, Москва: Логос.

resources. Therefore there is an endogenous incentive for data distortion. The results will be excessively optimistic, overrating output and underrating input. It is interesting to observe that this phenomenon is a characteristic not only of the communist planned economies, but of every project financed by public money.

This way we gradually learnt that planning is not motivated by a consistent and monolithic "social interest", but reflect a clash of various interest groups, which distorts the picture. It is impossible to achieve a voluntary consensus on a common plan of action.

At this point we have arrived at the deep, philosophical questions of the feasibility of national planning. Let us take the following train of thoughts: if people can be rational as individuals and as a firm or a company, then why cannot we expect the same rationality at the national level, at the macro level?

There was a hope that we can coordinate all activities in a national plan, which helps us eliminate the waste of the up-and-down frictions of a market producing either too much or too little. It was thought to be more efficient to coordinate the process by planning based on *ex ante* calculations instead of relying on *ex post* signals of excess demand or excess supply or volatile price movements. Rather than permanently correcting the state of disequilibrium after it occurred, we tried to plan equilibrium in advance. It is a complicated task, it cannot be solved by using primitive calculations of the four basic operations. It can be fulfilled, however, with the use of our sophisticated mathematical model and the computer!

We learned through our own experience that society is not a harmonious team of smoothly cooperating individuals. The clash of various interests between special groups persists. The poor mathematical planner just keeps hitting the keyboard of his computer naively, while the political atmosphere of conflicting groups is boiling around him. Gradually we learnt the bitter lesson: no matter how sophisticated the planning model is, it cannot be an answer to the problems. What really helps is a more efficient organism of institutions, property relations and incentives. We have to replace the existing socialist system and the planning model with another system, with a market economy based on private property.

Many economists gradually left the field of mathematical planning. I did so in the late 60s for several reasons. I was attracted by a new research program. I started to work on my books *Anti-equilibrium* and *Economics of Shortage*. Some of my colleagues proved to be more persevering, they continued with mathematical planning until the collapse of the communist system.

After this brief overview of the past let us discuss the present situation. I focus my remarks on the description of Eastern Europe, the former communist countries.

A negative connotation has been attached even to the word "planning", it has become completely discredited. It is not politically correct to speak about planning any more, it is something "Bolshevik", something evil. The Gosplan in Russia, or the National Planning

Office in Hungary has been dismantled. There are no more One-Year, Five-Year or Long-Term Plans. Most of the economists who once worked on planning models have been retrained and are working on other tasks now. In higher education even a good student of economics can get a degree without Wassily Leontief's name being mentioned during his studies, not to speak about the I-O analysis. It is not part of the general curriculum, here in Eastern Europe it is *passé*. The young generation of economists is not familiar with Leontief's name or his ideas any more.

However, there are some respectable exceptions. For example, at the Hungarian University of Economics, at Corvinus University, there are one or two courses that specialize in mathematical economics. Input-Output analysis and linear programming are included in the syllabus of these courses, which are attended by about a fifth of the students. Data compilation goes on in most of the central statistical offices, I-O tables are regularly complied in a large number of countries. The OECD pays a special attention to these. On the other hand, the statisticians are worried that there is little practical application of the I-O tables.

I-O tables are still used by some researchers who remained faithful to Leontief's original idea. They do serious work in I-O analysis. There is also an International Input-Output Association. They have meetings attended by hundreds of people and they publish a large number of interesting papers. However, very few of them are from the former communist countries, that is, from Eastern Europe or Russia.

The method does have some practical applications, but these are rather rare. These are quite interesting, for example, examining international trade or the environment. The I-O model is used as an *ex ante* analysis of the direct and indirect impact of certain changes, or for sensitivity analysis, and for a special type of cost-benefit calculations. But the idea of medium- and long-term planning has practically disappeared from the sphere of economics.

As a reaction to the recent crisis there is a strong criticism of unconstrained market forces. The only therapy offered to this problem can be expressed with one single word, namely *regulation*. It means that legal rules are applied to put the market forces under certain constraints, organizations are established for regular interventions etc. All that might be useful, but regulation is a much less ambitious undertaking than planning – the *ex ante* coordination of demand and supply.

So, what can be said about the future? Before finishing my lecture I raise the question: is planning a utopian dream so contrary to human nature that it can only be used by the force of Stalinist repression upon the economy? Or a new form of a reborn planning compatible with the market economy and competition will emerge one day? Let me quote Leontief's words:

"Planning is possibly one of the most ambitious things society can undertake in the economic field..."[4]

"I am one... who favors the introduction of national planning..."[5]

Leontief was talking in favorable terms about planning in the United States! He suggested in the 70s that a National Planning Board should be created instead of the Council of Economic Advisers. He referred to the French experience. Thirty-forty years ago there was a Planning Commission at work in France implementing a very special governmental activity called *indicative planning*. The term was used in contrast with the Soviet-type *imperative planning*. *Indicative planning* meant the preservation of market economy and private ownership, complemented by some influence of planning. The meaning of this term was as follows:

Alternative future scenarios and alternative routes were elaborated to reach alternative terminal situations, not only with macro figures, but also in Leontief's spirit, with disaggregated economic indicators.

There was a public debate between the representatives of various classes, groups and professions about the pros and cons of alternative scenarios for the future. Attempts were made to apply *ex ante* coordination and reconciliation and to approach a consensus.

Perhaps there is a chance of the reappearance of some kind of indicative planning. Perhaps. Those in this audience representing the younger generation will see. If so, it will be in accordance with Wassily Leontief's legacy. Leontief, had he attended this meeting, would have encouraged you to use the sophisticated toolkit he and his colleagues provided for active policy-formation. I, myself, am more hesitant, more sceptical about it, but who knows? I finish my speech with a question mark. Thank you for your attention.

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[4] *Challenge*, 1974, „What an Economic Planning Board Should Do" p. 35.
[5] *Essays in Economics,* 1977, White Plains: Sharpe, Volume Two, p. 150.