

Control and Cybernetics

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Control Theory and Economics

Ladies and Gentlemen:

I feel very honored to deliver the welcoming address to the present VII Polish-Italian Conference on System Theory and Mathematical Economics.

Each conference, taking part alternately in Poland and Italy, witnesses a new stage of development of mathematical economics and system theory in our countries. These conferences became already traditional and on the occasion of the present conference one is tempted to take a historic look of the development in both countries. I feel the historic look is of interest when one wants to evaluate what have been achieved so far or — when one wants to see what are the prospectives for the future activity.

I believe many of us still remember the time, in early sixties, when the concepts, developed mainly by control engineers, such as feedback and stability induced an interest among the leading economists. Among them were economists well known in Poland and abroad, like Oskar Lange and Michał Kalecki. Being active up to his early death Lange as well as Kalecki were very fond of contacts with scientists working in control theory. The results of these contacts came out in the form of several papers and monographs, which are being read up to now by many economists and system scientists.

I believe that the personal contacts with economists had a stimulating impact on many young people, working in control theory and participating in our conferences.

At that old time, most of us (by us I mean people with engineering background) worked in optimum or adaptive control. We felt however that the complex nature of industrial as well as economic processes requires a new methodological approach, which would enable to deal with such phenomena as complexity and dimensionality of real systems, decentralization of decisions, the necessity of aggregation of information etc. As you know for that new field the name Large-Scale Systems Theory was soon adopted. Working in that field many engineers, including myself, have learned much from the economic literature dealing with decentralized systems.

And at that time, I think, we have realized once again that the both fields, i.e. systems theory and mathematical economics, can benefit much by close personal contacts including an exchange of concepts, ideas and general methodology:

Then, in the seventies, we witnessed an explosion of computer technology. It had also an impact on the systems and economic sciences.

It was discovered that computerized models can be used to help the planners and decision makers to deal with real economic processes. As a result, the growing demand for computerized economic models was observed and modelling activity started to grow fast.

The increased demand for computerized models had also an impact on the research program of the Institute of System Research of the Polish Academy of Sciences. Many of our current research projects, which will be presented also at our conference, deal with modelling of regional and sectoral economics. Due to the recent economic reform in Poland there is also a demand for models which enable to optimize the decisions within the decentralized management structure.

It stimulated also the research in the area of socioeconomic, demographic and environmental systems.

This, in turn, required the use of multi-goal approach and the application of new methodology based, in particular, on the cooperative game theory. To implement that kind of models we are trying to use the so called interactive computerized systems. The interactive procedures facilitate negotiations and enable reaching a consensus among the game participants. Using such an approach different development policies can be also investigated. Our feeling is that many of these games can be implemented using personal computers.

It is quite possible that the interactive models will find increasing applications in policy and decision making in the near future.

Speaking about the past, present, and future of Systems Theory and Mathematical Economics one should be aware of the importance of international cooperation. In the present world troubled by economic and political crises, shortage of natural resources, and pollution of environment, the future depends much on the development of science and technology.

Therefore the continuous extension of personal contacts and cooperation among the leading scientists and scientific institutions both within the countries and abroad is necessary and inevitable.

At the Systems Research Institute we pay therefore much attention to the organization and participation in international conferences and symposia.

However, among all our activities the Polish-Italian conferences play, I would say, a special and very important role. They give us an ample time to discuss, compare, and confront our approaches, methodology, and results obtained. They stimulate our work between the conferences and help us to integrate the activity carried out at different institutes of the Polish Academy of Sciences and at the universities. We come to these conferences also to meet our old friends representing research institutions and universities in both countries.

Let me therefore express my sincere gratitude to all the people and institutions which contributed to the organization of the present conference and to its all participants. First of all I would like to thank the Polish Academy of Sciences, represented here by Prof. Jerzy Litwiniszyn, Vice-President of the Academy. We are happy that the conference starts in Cracow. This city is not only the old capital of Poland, it is also a large center of cultural and scientific life.

I would like also to extend my gratitude to CNR and our Italian friends Prof. Antonio Ruberti and Prof. Mario Archelli for their contribution to the present Conference.

