THE GENERALIZED DYNAMIC INPUT-OUTPUT PRINCIPLE

Topic: Structural change and dynamics III
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Abstract
　　　My book, entitled as "The Generalized Dynamic Input-Output Principle " will be published in Chinese (about 280,000 words) by China Economic Publishing House http://www.economyph.com/ec/index.asp this February or later, has been advancing the Nonlinear Model of the Generalized Dynamic Input-Output System (NMGDIOS) and solving its optimal solution of Pontryagin maximum. The Generalized Dynamic Input-Output System(GDIOS), on the theoretical plane, which is going to be the result from the synthesis of the optimal control theory, the general reproduction, the productivity theory and the input-output analysis, not only includes both the NMGDIOS and the Linear Model of the Generalized Dynamic Input-Output System (LMGDIOS), but also has the comparative research of dynamic compositions and the optimum analysis of national economic models.

Facing a few of input-output tables, like the count of distinct digital map recorded around the world in a year or a certain period of the national economy. But, the input-output table of different years, however, can only indicate an isolated, static state at one time point of national economic situation, does not reveal which exists the inner and inevitable connection among different input-output tables.

Now the dynamic input-output model has been divided into closed and open, continuous and discrete type, and other forms, since 1948, when D. Hakins proposed in the form of differential equations describe dynamic input-output models. But, as so long as limiting the dynamic input-output analysis on the basis of the nature time series, is to meet the inconsistency problem between the theoretical prediction and the actual event on the time step size or the time point etc., which does not have the inevitable reproducibility characteristics necessary to predict the future events.

　　　Mach believed that a measure of the time and space is associated with physical movement. Hume believes that space and extensive than anything else, but in a certain order distribution of visible object full of space, and time is always a can change the object perceptible change was found. However, the significance of historical progress about time and space concept by Mach and Hume, which is the negating and criticizing the Newton's absolute rest time space view. As a case in point is that due to Mach and Hume about time and space concepts, in 1905, Einstein using Lorentz transformation introduced a speed of light is constant and the postulate of relativity, created the Special Relativity. Thus to people's inspiration is: there is no absolute rest of reference, time of measurement is also varies with its frame of reference.

　　　The Production Function Structure Classification(PFSC) in my book, as the result from my research for the evolution of labor instruments in human history, is the comparison study among laborers, his tools and its functions in historical evolution, abstracts have common characteristics and generalization. Therefore, carried out classifying sectors in accordance with the PFSC, to span of time step beyond nature and to get rid of the fixed time step and its sequence, thus makes the input-output analysis based on the qualitative change of productive forces in history, and is closely related to laborers, his tools and its functions, that come into being common rhythm or developed on the basis. So I use the PFSC to classify different structures for the input-output system and to approach the evolution of the varied typal input-output systems from lower type to higher one in accordance with different typal productive forces.

The GDIOS can be regard as making the choice in the varied time point, which connects with every type or each stage of productive forces and with the process of social reproductions, based

upon the dynamic structure and balance conditions of the varied productive forces, so that the GDIOS has a few of characteristics, due to the PFSC, such as speeding up the economy development, shortening the production cycle and raising productivity etc.

In book, I try using the principle of Pontryagin maximum, by constructing the Hamiltonian, forming and solving the corresponding Jacobian matrix, calculating with inhomogeneous differential equations solution and general solution form, thus constitute the Pontryagin maximum solution for the Generalized Nonlinear Dynamic Input-output Model and deduce the coexistence of diverse types.

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