The Analysis of the Structure of China's Digital Industrial Base on the Complex Networks

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Author: Zhijian Jiang
Co-Authors: Xu Jian

The industrial structure directly reflects the level of regional economic development and overall quality, and the interdependence and mutual constraints of the correlation structure between industries directly affects the current characteristics of the regional industrial structure and its evolution process, reproduces the correlation relationship between industries, and determines the role of each industry in the industrial linkage, which is conducive to regulating, optimizing and upgrading the regional industrial structure. Industrial linkage refers to the technical and economic links between industries with various inputs and outputs, including forward, backward and sideways linkage between industries. Input-output analysis is the most important analytical method, which is based on the general equilibrium theory and discusses the closeness of inter-industry linkage and the shape of linkage from the perspective of consumption and distribution among industrial sectors. At present, a large number of studies calculate the indicators characterizing the strength of industrial linkage according to the input-output table, and classify the industrial sectors according to the size of the indicators, among which the influence coefficient and induction coefficient are the most commonly used. These two indicators have two obvious problems, which are not conducive to the discussion of inter-industry relations. Firstly, they emphasize the backward and forward linkages between industries, but neglect the sideways linkages, and the linkage measurement is not comprehensive; secondly, these two indicators measure the global linkage effectiveness of a certain industry, but not the inter-relationships between specific industries. In order to more clearly show and analyze the network composed of forward, backward and lateral links between industries, with industries as nodes and links between industries as edges, the idea of complex network analysis can be introduced.

This paper tries to propose a metric method of industrial linkage on the basis of domestic and international research on complex industrial linkage networks, analyze the network structure characteristics of the effective linkage network of regional digital industries, and extract the key industries that play an important role in the network. It tries to answer the following two specific questions: (1) What is the location of linkage of related digital industry sectors in the network? In the industrial network, the degree of closeness of inter-industry links varies, and industries are either at the center or edge of the network links, or at the articulation position between associations, playing the efficacy of direct control, indirect control, etc., which is closely linked with the industrial development dynamics. The above network effectiveness of industries has the difference of network scale, and some industries play an effective role in the whole network, while some industries play an effective role within the associations. So, which industries have global effectiveness? Which industries have localized effectiveness? What kind of regularity exists in the connection between industries? (2) How is the network as a whole connected? Is there any industrial association? If so, what are the differences between them? How is the connection between industrial associations realized? Effective answers to these fundamental questions will facilitate the later research to re-examine the characteristics of digital industry structure from the perspective of inter-industry connections, add a new influence factor to explain the differences in the development of each digital industry through the analysis of the differences in the positions and roles of specific industries in the industrial network, and analyze the evolutionary process of the digital industry structure through the changes in the network roles and positions of specific digital industries and the perspective of inter-industry interactions, so as to provide a better understanding of the evolutionary process of digital industry structure. Through the changes of network roles and positions of specific digital industries, we analyze the evolution process of digital industry structure from the perspective of

inter-industry interaction, so as to provide scientific basis for the formulation of industrial guiding policies, such as optimization and adjustment of digital industry structure.