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Information Infrastructure, Spatial Spillover and Digital Trade Status

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DESCRIPTION

With the gradual deepening of the Global Value Chain (GVC) division of labor, coupled with the increased trend of regionalization and localization of products and services in the post-epidemic era, the global economy is changing in the direction of digitalization and informatization. Digital trades have become a new driving force to strengthen global and regional economic and trade cooperation and promote economic growth. UNCTAD released the 2019 "scale of trade in digitizable services," which shows that the scale of global exports of digitizable services has increased from $1.9 trillion to nearly $3.2 trillion from 2008 to 2019, and the proportion of global services exports is as large as 52%. At the same time, Digital Trade (DT) provides a new opportunity for regional economic and trade cooperation among countries along the "Belt and Road" (B and R) to enhance the international division of labor and form international competitive advantages.

The development of DT is supported by information infrastructure such as the Internet, and thus the latter has become an essential factor. From a realistic point of view, most countries along B and R are currently developing countries, and their information infrastructure construction is relatively backward. Taking the number of fixed broadband and fixed telephone as an example, the World Bank statistics in 2018 show that Afghanistan has only 0.043 and 0.43 fixed broadband books and fixed telephones per 100 people among the countries along B and R, which is about 79 times and 110 times different from the highest Belarus. The poor information infrastructure level of the countries along B and R not only limits the development potential of DT but also forms an obvious constraint on regional economic and trade cooperation through the division of labor in the value chain, both of which will directly affect their international division of labor status and the size of international economic and trade rule making power and discourse. Therefore, it is of great theoretical and practical significance to study how to improve the level of information infrastructure facilitation, and then promote the digital industry cooperation and trade flow along the regional routes, promote the upgrading of industrial structure, improve the international division of labor status, and enhance the discourse and cooperation dominance in the global economic and trade rules.

Regarding information infrastructure and DT status, the existing literature mainly focuses on the economic and trade effects of information infrastructure and DT network status of each country, and it is relatively rare to examine the relationship between the two roles. In fact, on the one hand, the expansion of the bilateral DT scale does not necessarily enhance the global competitiveness of DT. The latter needs to be analyzed from a global perspective. In contrast, the Complex Network Approach (CNA) analyzes and studies from the perspective of the relationship between nodes, and the

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approach applies to the study of digital trade status issues. On the other hand, information infrastructure has externalities, and the improvement of information infrastructure in other countries will impact the level of information infrastructure in their own countries. For example, the railroad construction between China and Laos will positively affect China while improving the level of infrastructure in Laos. However, existing studies do not consider the spatial spillover effect of information infrastructure. Moreover, existing studies have yet to establish a theoretical model between information infrastructure and digital trade status to conduct systematic research under a unified analytical framework.

Given this, the innovation of this paper makes the following three contributions worthy of reference by the academic community. First, by constructing a theoretical model of an international trade network in three countries, the paper theoretically clarifies the mechanism of the role between information infrastructure and digital trade status, which provides a micro foundation for studying the macro issue of trade status and also provides theoretical support for promoting the development of cross fertilization between international trade and complex network disciplines. The theoretical model applies to the digital trade status issue and provides a valuable methodological reference for other trade networks and their status issues. More importantly, the model establishes a "bridge" between international trade theory and the complex networks approach.

Second, the paper obtains value added trade data of digital industries in the countries along B and R by the value added accounting method and analyzes the evolution of the DT network structure of the countries along B and R from the global perspective of the network using the CNA, and analyzes the changes in the distribution of digital trade status of each country. This factual analysis with technical support provides a new perspective to objectively reveal the overall network structure of digital trade along B and R, and analyze the real trade relations among countries and their control over digital industry resources. Not only the digital industry the CNA is also applicable to other industries and has cross-disciplinary characteristics.

Again, the paper considers the spatial spillover effect of information infrastructure from a realistic perspective and adopts a spatial econometric model to test the impact of information infrastructure on digital trade status in countries along B and R, providing empirical evidence to promote the upgrading of digital trade status and the climbing of international division of labor status in countries along the route. In particular, in terms of heterogeneity analysis, this paper adopts a more objective matrix decomposition to examine the country differences in information infrastructure among the countries along B and R separately, which can overcome the shortcomings of traditional spatial correlation between samples through artificial grouping, thus causing biased estimation.

Finally, this paper further examines the causes behind the positive spatial spillover effect of information infrastructure in the countries along B and R from the perspective of trade competition relationship, which provides a reference for constructing an inclusive digital trade value chain in the region along the route and enhancing the international division of labor status.

In conclusion, this paper selects a realistic topic, considers DT as a frontier emerging issue, integrates a CNA and spatial measurement approach, realizes the connection between international trade theory and CNA, and provides an essential reference for promoting the cross fertilization of international trade and complex network.