

The Selection of Spatial Development Mode of Producer Service and Its Spillover Effect on the Manufacturing's Transformation and Upgrading

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ABSTRACT. With the rapid development of information technology and the acceleration of factors flow, producer services are becoming more tradable. The geographical mobility and spatial pattern of producer services are no longer unchanged. As a result, the spatial organization mode of producer services tends to be more complex, and the functional system layout mode of producer services tends to be more diversified. In this context, the selection of appropriate spatial mode of producer services is important to promote the growth of manufacturing industry. Moreover, under different spatial modes of producer services, such as specialized agglomeration and diversified agglomeration, the geographical interaction relationship between producer services and manufacturing industry are different. Therefore, this paper analyses the impact mechanism and spillover effect of heterogeneous spatial modes of producer services on the transformation and upgrading of manufacturing industry. Finally, this paper puts forward policy implications to optimize the spatial distribution of producer services and exert its externality to the high-quality development of manufacturing industry.

KEYWORDS: *producer services, manufacturing's global value chain, spatial development mode, spillover effect, heterogeneity*

1 Introduction

Producer services, as intermediate inputs and supporting services directly related to manufacturing industry, bring increasingly specialized human capital and knowledge capital into the process of industrial value-added creation. The role of producer services in the upgrading of manufacturing industry is becoming more and more prominent. Actually, with the rapid development of modern information technology, more convenient flow and allocation of cross-regional resource elements, and more rational division of industrial space, the spatial development mode or organizational mode of producer services is also becoming more and more differentiated. Due to the diversified demands for the input of producer services at the different stages of manufacturing's value chain, such as the process upgrading, product upgrading, function upgrading and chain upgrading, how to optimize the dynamic matching efficiency between producer services and manufacturing enterprises on geospatial dimension is crucial. Therefore, the spatial allocation efficiency and geographical pattern optimization of producer services has become a new engine for the transformation and upgrading of manufacturing industry.

As an important phenomenon of urban economic activities and an important form of industrial geographical distribution, industrial agglomeration has a significant impact on the formation of urban spatial functions and the growth of regional productivity. According to whether the externality of agglomeration comes from the same industry, the agglomeration of producer services can be divided into

specialized agglomeration and diversified agglomeration (Panne, 2004). These two agglomeration economies of producer services have their own characteristics. There is still no consensus on which agglomeration mode contributes more to the upgrading of industrial value chain. Therefore, this paper will explore the interaction mechanism and spillover effects of the spatial development modes of producer services on the upgrading of manufacturing industry, and put forward some suggestions for it.

2. Review of Literature

The spatial interaction between producer services and manufacturing industry has attracted wide attention. Many existing literature analyzed the impact of agglomeration of producer services on the upgrading of manufacturing industry from the perspective of transaction cost, geographical distance, hierarchical division of labor, knowledge spillover and so on. Most articles believe that the agglomeration of producer services is conducive to promoting the upgrading of manufacturing value chain (Yuan et al., 2017). However, there are still relatively few studies that focus on the impact of specialized agglomeration or diversified agglomeration of producer services on manufacturing global value chain from the perspective of spatial allocation efficiency. In fact, due to the different spatial characteristics of specialization and diversification of producer services, their impact mechanisms on the upgrading of manufacturing industry is also distinct. Most of the existing studies on specialized and diversified agglomeration modes mainly focus on the agglomeration externality of manufacturing industry, and lack of adequate studies about the externalities of producer services' agglomeration.

Influenced by multiple factors such as location, resource endowment and industrial policy, the scale and level of industrial development in various cities are different, which leads to significant differences in the demand scale and categories of producer services, thus affecting the choice of specialized and diversified agglomeration of producer services. In the existing literature on agglomeration externalities of producer services, some papers believe that the specialized agglomeration of producer services can help to promote upgrading of manufacturing's value chain through channels of cost saving, labor market sharing, input-output correlation and knowledge imitation. Other papers argue that diversified agglomeration of producer services is more conducive to the upgrading of value chain of manufacturing. It is because that a large number of enterprises in different industries cluster in the same region, which is more conducive to the diffusion and spillovers of more diversified knowledge between those complementary industries rather than in the same industries. Therefore, the diversified agglomeration of producer services is more conducive to the externalities of related industries and thus the upgrading of manufacturing industry. Unfortunately, literature on the spatial spillover effect of agglomeration of producer services is relatively insufficient, and the spillover effect of agglomeration of producer services on the interactive development of producer services and manufacturing industry in surrounding areas has not yet attracted enough attention. Therefore, this paper tries to clarify the impact of agglomeration externalities of producer services on the upgrading of manufacturing industry.

3. Theoretical Basis and Influencing Mechanism

3.1 Spatial mode of producer services and the manufacturing's global value chain

With the restructuring of global production network, the traditional production mode of mass and standardized production has ceased to exist. The flexible production characteristics of modular organization that responds quickly to the market appear, and the new production organization form will replace the traditional mode. While the traditional mode of production and the new flexible mode of production are transformed and handed over, the industrial value chain is transformed from the vertical integration to the vertical separation and reconstruction. The focus of industrial value chain is gradually extended from the production field to the service field, with multiple spatial layouts of producer services such as R&D and Design, marketing, after-sales service, brand operation and so on.

How can the spatial distribution of producer services better meet the needs of upgrading of manufacturing's value chain? Some articles point out that the agglomeration of producer services can promote the manufacturing's value chain by deepening the specialty division, reducing the transaction costs, enhancing the economies of scale, strengthening the competitive learning effect, and promoting the spatial spillover effect. From the perspective of global value chains, Humphrey and Schmitz (2002) summarized four main types of global value chains and distinguished four upgrading modes according to the different relationships and locations of enterprises in global production networks. The four types of global value chains include the market-based, hierarchy, captive network and balanced network. Based on it, the four main upgrading modes of global value chains can

be defined as process upgrading, product upgrading, functional upgrading and chain upgrading. Furthermore, Kaplinsky and Morris (2002) pointed out that the upgrading of global value chains in developing countries usually begin with the stage of process upgrading when embedding in global value chain, then upgrade their products and functions in global value chain, and ultimately reach the advanced stage of chain upgrading. It is a process of interdepartmental upgrading. Corresponding to this logic of upgrading of global value chain, there will be heterogeneous demands for producer services at different stages of upgrading of manufacturing industry. In other words, the scale and categories of various demands for producer services at different stage of upgrading of value chain of manufacturing industry determine the choice of spatial mode of specialized or diversified agglomeration of producer services.

When the manufacturing enterprises are at the primary stage of value chain upgrading, such as the process upgrading or product upgrading, their demands for producer services are relatively single, or their total market demand for producer services is difficult to support the diversified agglomeration of producer services enterprises. In this circumstances, the specialized agglomeration mode of producer services is more conducive to the upgrading of manufacturing's value chain. One possible explanation is that specialized agglomeration mode of producer service is more conducive to integrating the resource advantages of service enterprises into specific service business activities, which helps to reduce costs, achieve economies of scale, build core competitiveness advantages, and meet the needs of upgrading of manufacturing's value chain. Therefore, it is important to select suitable agglomeration modes of producer services to meet the dynamic demands of upgrading of manufacturing's value chain.

When manufacturing enterprises are at the advanced stage of value chain upgrading, such as functional upgrading or chain upgrading, their market demand for producer services is more diversified and the scale of demand is larger. In this case, the diversified agglomeration of producer services will play a more significant role for the upgrading of manufacturing's value chain. This is because that diversified agglomeration of producer services can help to enrich the variety of business services and provide a wide variety of producer services to satisfy the needs of different stages of transformation and upgrading of manufacturing industry. Producer service enterprises can integrate their research ability, production capacity, operation ability and brand reputation more extensively, avoid or disperse risks more effectively, integrate and utilize resource elements more fully. Thus, the goal of sharing and complementarity of diversified resources can be realized, and the supporting role of diversified producer services in the transformation and upgrading of manufacturing's value chain can be enhanced. Consequently, producer services are suitable to choose more diversified and comprehensive spatial mode that can fully meet the differentiated needs of manufacturing's upgrading.

3.2 Spillover effects of spatial modes of producer services on the global value chain

The impact of agglomeration externalities on the manufacturing's global value chain is not limited to local areas. With rapid development of information technology, frequent factor mobility and increasing interregional cooperation, producer services will not only provide "localized" services, but also have a certain spatial spillover effect on the interactive development of producer services and manufacturing in other regions, especially in the surrounding areas. In

other words, the agglomeration of producer services will have a significantly spatial spillover effect on the upgrading of manufacturing industry. From the perspective of specialized and diversified spatial agglomeration mode of producer service, the spatial externality will also vary with the demand of different stages of manufacturing's value chain upgrading. Generally speaking, the spatial spillover effect of producer services with relatively high degree of localization is not so significant. Specialized agglomeration of producer services can significantly promote the upgrading of local manufacturing value chain, while it is not so prominent in the surrounding or adjacent areas. The spillover effect of specialized agglomeration of producer services is significant among cities, but it decreases with the increase of distance due to the impact of transaction costs and "face-to-face" contact demand. In contrast, lower degree of localization of producer services usually come along with stronger spillover effect between peripheral cities. The diversified agglomeration of producer services will play an obvious role in promoting the upgrading of manufacturing in both local region and its surrounding areas. In other words, the diversified agglomeration of producer services can not only meet the needs of manufacturing's value chain upgrading in local region, but also meet diversified needs of manufacturing in the surrounding or adjacent areas through the mechanism of resource sharing and technology spillover.

However, whether it is specialized or diversified agglomeration, the expansion of the agglomeration scale of producer services will improve the local supply level of production factors, optimize local input-output links, promote local production and management efficiency, thus promoting the upgrading of local manufacturing industry. On this basis, the agglomeration of producer services can

also promote information exchange and knowledge diffusion by means of inter-regional contractual cooperation, cross-regional flow of factors, transfer of technology transactions, thus promoting significant externalities on the interactive development of manufacturing industry and producer services in the surrounding or adjacent areas. It should be pointed out that spatial spillover effect of agglomeration of producer services on the upgrading of manufacturing industry has a geographical boundary. Therefore, planning and optimizing the spatial distribution of producer services is very important for the development of manufacturing industry.

4. Conclusion and Enlightenment

This paper studies the impact mechanism and spillover effect of spatial development mode of producer services on the dynamic evolution of manufacturing's value chain. The results show that at different stages of manufacturing's value chain upgrading, the scale and categories of demands for producer services determine the selection of spatial distribution of producer services. When the development of manufacturing enterprise is at the initial stage of value chain upgrading, specialized agglomeration of producer service has played a more significant role in the transformation and upgrading of manufacturing industry. In this context, choosing the spatial mode of specialized agglomeration of producer service will be more appropriate to match the upgrading needs of manufacturing's value chain. When the development of manufacturing enterprises is at the middle and advanced stages of value chain upgrading, diversified agglomeration of producer services plays a more prominent role in the transformation and upgrading of manufacturing industry. Under such circumstances, choosing the spatial mode of diversified agglomeration

of producer services can better meet the needs of manufacturing's transformation and upgrading. Moreover, the spatial mode of producer services shows significant spatially externalities on the upgrading of manufacturing's value chain both in local region and neighbouring region. In addition, this paper also finds that lower degree of specialized agglomeration and higher degree of diversified agglomeration of producer services brings stronger spillover effect on the development of manufacturing industry. However, limited by transaction costs and "face-to-face" contact demand, the spatial spillover effect of producer services agglomeration on the development of manufacturing industry decreases with increasing distance. Based on the above, this paper proposes the following countermeasures.

Firstly, it is suggested to optimize the spatial mode of producer services and strengthen its role in the development of manufacturing industry. According to the needs of local manufacturing enterprises at different stages of transformation and upgrading of value chain, urban administrators should guide producer services to carry out more reasonable spatial distribution. On one hand, optimizing industrial spatial organization needs to strengthen the role of market mechanism, implement effective spatial planning and improve land use efficiency, which will be helpful to guide location choice of service enterprises, and form reasonable spatial pattern of producer services that can satisfy the needs of transformation and upgrading of manufacturing industry. On the other hand, promoting specialized agglomeration and diversified agglomeration of producer services should be tailored to local conditions rather than one-size-fits-all. Small and medium-sized cities should pay more attention to promoting the specialized agglomeration of producer services, strengthening economies of scale

and reduce the cost of manufacturing's production and operation. The central city or metropolitan area should focus more on the diversified agglomeration of producer services, and construct the service support hub which leading the upgrading of manufacturing industry in both local region and its surrounding areas.

Secondly, it is suggested that the collaborative mechanism of government, enterprises and society should be constructed to strengthen the spatial spillover effect of producer services agglomeration on the upgrading of manufacturing's value chain. In order to optimize the spatial structure of producer services, it is essential to promote institutional innovation, construct cross-regional coordination system, and build up benefit-sharing mechanism for coordinated development of interregional industries. Besides, it is also necessary to optimize the multi-center and networked spatial structure and functional system of producer services, strengthen the efficient cooperation between upstream and downstream industries, and promote the infrastructure sharing, value chain matching and original knowledge diffusion. It is necessary to break through the natural conditions and institutional constraints that affect the boundaries of spillover effects, break down administrative barriers, increase accumulation and investment of human capital and transportation infrastructure, and ultimately strengthen the spillover effect of spatial distribution of producer services on the upgrading of manufacturing's value chain.

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