

Research on Supply Chains Embeddedness and Spatial Organization of Firm

Zhang Yan, Kong Liping

School of Economics and Management, Wuhan University, Wuhan, P.R. China, 430072

(E-mail: zhangyan626262@126.com, kongliping3006@sina.com)

Abstract This paper discusses spatial organization of firms' region selection, spatial concentration and global space network, under the development trend that the supply chains have been from the regionalization embeddedness to localization spatial concentration to global space network. We find that with the globalizing evolved to chain competition in recent times, spatial organization of firms will present the progressive development process of which from point to line to cluster to network. So this research has a great theoretical and practical significance.

Key words Supply Chains embeddedness, Spatial organization of firms, Cluster, Network

1 Introduction

In the context of globalization, the organic bond of modular production, supply chains networks, mass customization, enterprise virtualization and the dispersion or concentration of spatial organization, all of which are in continuous research and innovation, has become the major trends of supply chains and spatial organization. The supply chains embeddedness has its own spatial features. Enterprise supply chains experience the extension from the localization to regionalization to globalization, acting same-chain embeddedness and across-chain embeddedness on these three spatial scales, as a result, supply chains relationship network of different spatial scales is formed.^[1] Compared to the traditional business investment theory, supply chains embeddedness pays more attention to the factors and the impact from local environment to enterprise region selection and spatial organization. This view is in line with the premise assumptions and analysis that under the globalization environment, supply chain competition will replace single enterprise competition.

On the theory of supply chains embeddedness, (Granovette 1973), (Gulati 1998), (Uzzi 1997) and other scholars recognized that in the supply chains network, between the suppliers and manufacturers, the manufacturers and distributors, there was a high embeddedness relation. (P.J.Batt 2003) used the structural embeddedness, relational embeddedness and knowledge embeddedness to study the supply chains performance. (T.Suh,W.G.Kwon 2006) used social rules, social embeddedness to study the trust relationship between supply chains. (Ai Shanggan and li Haiyin 2005) realized the necessity of embeddedness in supply chains, and they thought that trade among upstream and downstream node enterprises mainly showed a continuous and repeating relational trade.

On the theory of spatial organization, spatial organization is a concept of economic geography. According to different research objects, it shows different connotations. For those scholars from regional economy (industry) research, they thought spatial organization meant the process that those resources optimizing and allocating in regions or among regions under a certain constraint condition (Jiang Qinghai,1997). (Xu Yan 2004) thought it was an important regional economy of organizational forms. For those city geographer, they thought spatial organization can organize and arrange various material element, so that can promote the city's system to evolve from disorder to order and from junior to senior (Xie Shouhong,2003). In business geographers' eyes, connotation of spatial organization expressed in three aspects at least, which were enterprise elements' spatial displacement, selection of plant location and spatial expansion of enterprise organizational structure (Wang Dezhong,2002). While (Wang Chengjin 2005) considered that spatial organization should structure from enterprise location, enterprise spatial relation and location selection.

2 Supply Chains Embeddedness and Spatial Organization of Firms

2.1 Supply chains embeddedness

Supply chains is a cross-regional and cross-functional spatial organizational network including both internal and external of the enterprise, and it links networks from suppliers to all customer members, as well as the full process of raw materials procurement, manufacturing, assembly, distribution, delivery to the final consumers. It is a multi-level spatial organization network which is shown at spatial characteristic. In terms of level, it can be divided into local, regional and global three supply chains of

different spatial forms. The local embeddedness means in the local small-scale market, enterprises rooted in local culture, embed into upstream and downstream supply chains enterprises and local enterprises in similar products, leading to the local enterprises supply chains crossing and netting. Regional supply chains refers to the process that those owing local advantages enterprises make supply chains extend to the outside in order to build up a regional supply chains. Global embeddedness means a state or a process that mutual embeddedness between transnational corporations or node enterprises of multinational corporations.

2. 2 Supply chains embeddedness and spatial organization of firms

The spatial organization of firms refers to the composition and dynamic layout of various functional units. From the perspective of supply chains embeddedness, the spatial organization not only includes enterprise's own region selection, spatial linkages and organizational structure, but also should take embedded chain and macro-environmental factors into account. [2]On the basis of supply chains embeddedness, this paper will discuss spatial organization model from supply chains embeddedness affecting factors with region selection, supply chains localization with enterprise spatial concentration, and supply chains globalization with spatial network the three aspects.

3 Supply Chains Embeddedness and Spatial Organization Model

3.1 Supply chains embeddedness with region selection

Region selection means the local decision-maker searches for a specific spatial location in order to achieve expected objectives. Because of some variance in strategic objectives, enterprise resource capacity and supply-chain partnerships, chain node enterprises of different levels will show different attitudes and behavior to local investment.

3.1.1 Supply chains embeddedness affecting factors and region selection

The traditional costing school focused on raw materials fuel fare, labor costs and agglomeration (Weber,1909), recently, in the context of economic globalization, they pay more attention to market, resources, technology, agglomeration, institutional and even social structures with relationship network, while the supply chains embeddedness affecting factors also present complex, dynamic and diverse features. From the view of supply chains, enterprises hope their supply chains firms can embed by following the cross-regional investment which caused by strategic goals adjustment, so as to reduce the costs and risks happening at the initial reconstruct supply chains. As a result, the behavior respond and intensity of supply chains node enterprises are important factors for region selection. Compared with traditional theory, supply chains embeddedness emphasizes on marketing and institutional openness, it attaches importance to the scarce resources (such as labor quality, knowledge, information, personnel, technology, social networks and so on). [3]As shown in Figure 1:

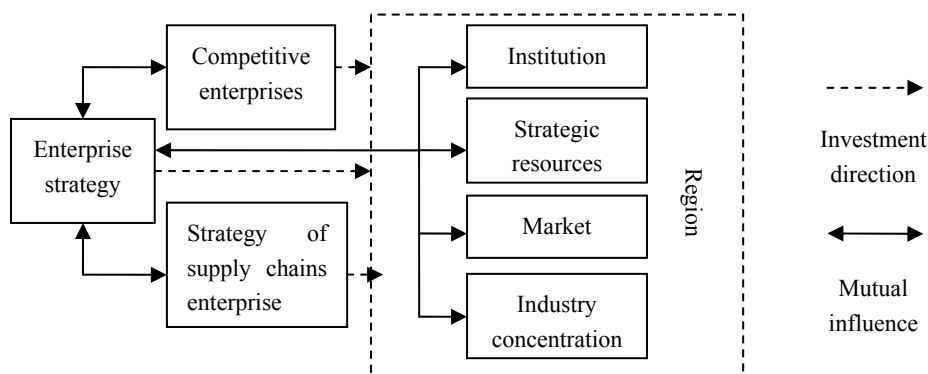


Figure 1 Supply Chains Affecting Factors in Region Selection

(1) Enterprise strategy and investment motives are closely linked. Because of limited internal resources, enterprises choose external resources or rely on other companies to complete strategic task. To establish the supply chains with suitable enterprises in the appropriate region and allow other companies to share the different function businesses of multinational companies has become the important spatial organization choice to help multinational companies respond to global market rapidly and enhance organizational efficiency.

(2) Supply chains node enterprises, especially those have long-term stable supply chains

relationships, play an important role in region selection for interregional investment enterprises. The following region embeddedness of these node enterprises can greatly eliminate leading enterprises' supply chains risk facing in the separate region embeddedness. After the incentives, if critical supply chains enterprises are still reluctant to follow up, the leading enterprises will face two kinds of region decisions. One is to continue region embeddedness, increasing the cost of nurturing local supply chains; the other is to obey critical enterprises' suggestion, abolishing the region embeddedness decision.

(3) Competitive enterprises' development strategy, operational principle and management models have become important information resources that affect decision making. Their investment intentions or actions for specific location, as a signal source, also impact region selection greatly.

(4) The market and institution factors are mainly reflected in the market potential, the openness of markets and institutions, as well as the institutional concessions. For the market potential, it doesn't only just depend on population, but focuses on economic strength and development trends of this region, consumption structure, habits and tendencies, as well as the recognition of products. The open system and market, is an important region selection directing for those competitive companies. In terms of obtaining more favorable institutional security, the collective investment can own much more rights than the single investment. It helps enterprises and following supply chains members to win more favorable institutional arrangement.

(5) In order to obtain strategic resources, to establish supply chains relationships with individuals or enterprises owing scarce resources, has become the main purpose of region selection. In addition to traditional land, raw materials, fuel, low labor costs and traffic conditions, scarce resources also include strategic capital, technology, knowledge, information and social relations networks.

(6) Both industrial concentration from medium level or enterprises concentration from micro-level, they can bring spatial facilities to help companies win more suitable labor and more optional suppliers, and also make it easier to obtain cooperation and technological innovation, especially when concentration under local governments (such as industrial parks), this kind of concentration always can gain a series of political profits, such as complete infrastructure and management services. Preference of concentration factors, is not only reflected in external economies of scope sharing talent, technology, knowledge and information from enterprises concentration, but also expressed in external economies of scale from the raise of supply chains overall efficiency.

3.1.2 Strategic selection of region

According to the above analysis, on the strategic selection of region, there are four types: low-cost strategy, market strategy, supply chains concentration strategy and technology strategy.

Low-cost strategy aims at obtaining low-cost resource, its region direction focuses on low-cost concentration region, and the region embeddedness of internal supply chains link begins with production or procurement link. Market strategy aims at occupying more market, those target markets owning many potential customers are the important region selection for business investment, its sale links are often pre-embedded. Supply chains concentration strategy aims at gathering nearest supply chains support as the starting point, attaching importance to the regions in which have many suppliers, partners, key customers and industry supports. Compared with the low-cost strategy, the two strategies are all pre-embedding in production link, but the supply chains concentration strategy's procurement link embedded obviously lags behind. Technology strategy aims for obtaining new technology and management method, so its supply chains region embeddedness always near the regions where own abundant technology, management and innovative ability, and the research and development links are often embedded in advance.

3.2 Supply chains localization and organization of enterprise cluster

Enterprises based on strategy adjustment and structure restructuring are in need of supply chains management and competition, so they should quickly realize the supply chains localization as center of a specific location in some primary target markets, and build some clusters so as to support choices for replying the new environment and challenges after the region embeddedness.

3.2.1 Supply chains localization

We divide localization into atomic firm's localization and multinational company's localization. Atomic firms are local and they always first take root in the socio-economic structures familiar to entrepreneurs. By embedding in local socio-economic structures, they can achieve the integration of enterprise technology with local industrial structure and culture and local consumption culture. Multinational companies localization refers to the dynamic process that from region embeddedness to localization of internal supply chains and localization of external supply chains node enterprises when the multinational enterprises executing the global localization strategy. The feature difference between

them can be seen in Table1. In this paper, we mainly discuss localization in multinational companies.

Table 1 Feature Comparison of Supply Chains Localization between Atomic Firms and Multinational Companies

Types of enterprises	Resources advantage of supply chains embeddedness	Length of supply chains	Special border of supply chains	Open to public	Competitiveness of supply chains
Atomic firms	Familiar society economy, culture structure and relational network	Short	Have	Closing	Weak
Multinational companies	Resource of technology, capital and management experience	Long	Not have	Opening	Strong

Supply chains localization cluster is a combination of supply chains localization with industrial cluster, also is a result of the local dynamic concentration of internal supply chains links with external main suppliers in multinational companies. There are two bases for its appearance, one is the region embeddedness of supply chains elements, and the other one is the accumulation of it. Key elements of region embeddedness are system drive and economy drive. Cycle accumulation is contributed to mass concentrations of supply chains elements at a certain space, thus forming the supply chains localization cluster. While those successful demonstrations which are based on cost savings, resource-driven, and establishment of trust relationship from indigenization, play an important role in promoting the correlate enterprises' follow-up embedded as well as the growth of supply chains localization cluster, which comes from leading enterprises' attraction to other node companies and competitive firms in same products. As shown in Figure 2.

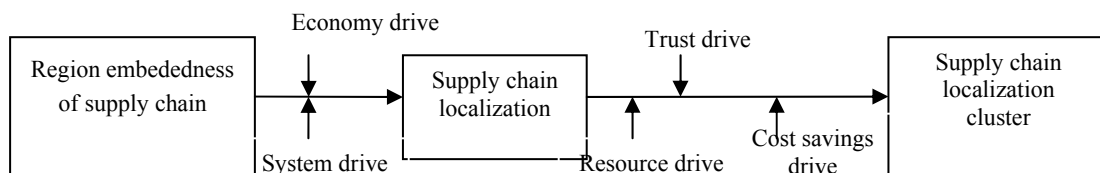


Figure 2 Drive Factors of Supply Chains Localization Cluster

3.2.2 Driving forces of supply chains localization cluster

For a target market, from the initial region embeddedness to supply chains localization, economy drive and system drive are important to multinational companies. (1) Economy drive, mainly includes: ① To win more market interests. Multinational companies implement supply chains localization, adapt to the local culture, and use local business talents to produce and sell products or services to specific areas, the ultimate goal is to maximize profits in the market; ② To gain resources. A significant goal of multinational companies is to obtain strategic resources, such as talent, knowledge, technology, information and other resources, especially in low-cost way. ③To reduce costs. Because the region embeddedness will lead to the original supply chains elongation, then increase logistics costs, by localization can lower some associated costs; ④ To cater to consumer preferences. Localization provides local cultural elements for multinational companies and also takes a good opportunity for them to seek products and services which are suitable for local culture and consume habits, so as to help multinational companies win more consumers. (2) System drive, embodied in following aspects: ① Trade barrier. In order to response to trade policy with high import tariffs or quotas from host countries, multinational companies have to change the pre-export sales model to implement region embeddedness of production links, selling local production in local areas, with this strategic adjustment, many supply chains have carried much more localization of functional links. ② Requirement of localization rate, for the support and protection of local economy and related industries, many host governments set a certain percentage of the localization rate to transnational companies' operation action, to limit the overmuch resources import, and then increase local employment, contribute to the development and upgrade of local related industries. Under this background, localization of multinational companies is in fact a kind of passive acceptance for the operation rules made by host countries. ③ Local governance, some laws,

rules and local regulations from host countries can form direct or indirect impact on supply chains localization embeddedness. So to be familiar with relevant laws and regulations, to ensure safety in production and to fit the local social policy requirements can push the supply chains localization forward.

Three driving forces of supply chains localization cluster are: cost savings drive, resource drive and trust drive. (1) Cost savings drive. Supply chains localization cluster provides some benefits for lowering production costs through specialization and lowering transaction costs relying on supply chains interior. At the same time, enterprises can achieve internal economies of scale and external economies of scope. (2) Resource drive. Supply chains localization cluster can gather a lot of resource elements, not only to help enterprises obtain the near resources and capabilities for their own survival and development in convenience, but to be the important foundation for gaining near new knowledge, technologies and management knack, as well as to insure them lossless. (3) Trust drive. Because of geographic proximity, cluster provides frequent contacts opportunities for individuals, enterprises and supply chains. With personal or organizational reputation, commitment and relational learning opened in the cluster, trust drive can reduce uncertain opportunism between supply chains enterprises, and then reduce supervision costs and transaction cost.

3.3 Supply chains globalization and enterprise network organization

Within the global scope, to establish the global supply chains network which is in centre of leading enterprises internal supply chains and took part in global suppliers and local suppliers, the supply chains network has become a major action feature of firms' strategy under economic globalization.

3.3.1 From localization cluster to global supply chains network

At present, some multinational companies base on the home country supply chains localization cluster, to internationalize cluster, then to copy or derive some new supply chains localization clusters, which has become the significant organizational form for global strategy implementation to response to global market opportunities. The network connections in the process of supply chains globalization, both includes inside connection between different subsidiaries or parent- subsidiary, and outside connection formed in the cooperation between enterprises and global supply chains firms. Such inside and outside supply chains "network" has become a micro-management body for market globalization. "The micro trade subject for goods and services' market globalization isn't country, but the enterprises with its network" (Manuel Castells, 2000). In view of the important position of enterprise organizational network in economic globalization production, multinational companies are making their efforts to organize itself as the global network center, which means "network of networks."

3.3.2 Division of global supply chains network

Division of global supply chains network shows the division among supply chains leading enterprises, global suppliers and high-low-end local suppliers. Leading enterprises can through outsourcing, focus their energy on those challenging "core competencies" to obtain dynamic strength. For supplier quality and risk aversion considerations, they deliver a larger share of production to a group of companies which are less in number, larger in scale, and more mature in technology, as well as own "global antenna", furthermore, they will strengthen their cooperation with these groups so that the global suppliers are formed. As for the local suppliers, they are gradually differentiated into high-end suppliers and low-end supplier. The high-end suppliers become the main bearer of the division of global supplier value chains at a period of time, and they can make docking with global supply chains network by one's own supply chains network. For the low-end suppliers, if don't have the ability to attract local high-end and global supplier, they may face the gradual decrease in shares from network division, or even eliminated from the final global supply chains network.

3.3.3 Spatial structure of global supply chains network

Spatial structure of global supply chains network is divided into single-core type and multi-core type. Within the single-core type of global supply chains network, existing a network centre (leading enterprises), several hubs (supply chains localization clusters), lots of nodes (business unit of leading enterprises or supply chains nodes enterprises). Leading enterprises control whole network system by controlling the critical hubs of supply chains network, by virtue of their abundant technology and strong brand advantage. Multi-core type of global supply chains network is defined as when the leading enterprises or hubs in single-core supply network collaborating with other enterprises, different supply chains network nodes seize the chance to embed into each other's supply chains network along supply chains channels, so that can form an more complex and flexible global supply chains network than the single-core type. Distinguishes between the two is shown in Table 2.

Table 2 Structural Feature of Global Supply Chains Network

		single-core type	multi-core type
Leading enterprise number		One	Two or more
Supply chains relation		Elements flows are mainly of internal moving of supply chains network.	Elements flows move inside supply chains or between it, the global apace is formed.
Supply chains structu		Vertical integration feature is obvious for supply chains, the network structure is close.	Both owning vertical and horizontal feature, networking, specialization is clear, and the network structure is loose.
Supply chains governance		Emphasize on trust, vision and cooperation, and mainly about property management.	Emphasize on resource complementation and technical cooperation, coexist of contract and property management.

4 Conclusions

This paper based on supply chains embeddedness, from supply chains region embeddedness to spatial concentration of supply chains localization, then to spatial network of supply chains globalization, discussing the region selection of spatial organizations, spatial concentration and spatial network, then come to the result, that is, with the global competition being evolved into supply chains competition and region embeddedness of key elements (such as the leading enterprises) as well as spatial organization further development, enterprises supply chains organizations' projection to space is specifically incorporated from point(supply chains embeddedness) to line (supply chains partly embedded) to cluster (supply chains deeply embedded and its localization) to network (supply chains regionalization and supply chains globalization).

References

- [1] Liu Weidong, Zen Feng. G. Research on the Influence of Informatization to Social Economic Spatial Organization [J]. Geography Journal,2004,23(6) (In Chinese)
- [2] Ai shanggang, Li Haiying. Research on Formation Mechanism of Supply Chains Alliance Based on Embedded structure [J].Science and Technology Progress and Policy, 2005, 22(6) (In Chinese)
- [3] Chen Jing, Yang Kaizhong. Spatial Organizations and City Logistics[M].Beijing:Xinhua Press, 2005 (In Chinese)