

Research on Chinese Industrial Cluster Patterns —Take Haier Household Electrical Appliance as an Example*

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Abstract: Industrial cluster is an aggregation of the related enterprises and institutions in certain field and in certain place. There are mainly three patterns for industrial clusters: market-oriented cluster, foreign fund oriented cluster and endogenous brand oriented cluster. Many economists have established their own theories about the patterns industrial cluster, but there are few dealing with one big enterprises and its cluster pattern. This paper, taking Haier household electrical appliance as an example, is trying to study one model of Chinese industrial cluster and analyze its characteristics with their effects on economy, as well as the advantages together with the related suggestions from the authors.

Key words: industrial cluster; brand effect; endogenous brand cluster patterns

From the beginning of Marshall, many economists from home to abroad have various theories on industrial cluster. Since the 1970s and 1980s, industrial cluster has drawn more and more attentions. Especially after Michael E. Porter first came out with the notion “industrial cluster”, many countries try to foster and update the local industrial cluster, in order to improve the local competitiveness.

1. Theoretical Foundation and Research Background

There are two internationally acknowledged concepts of industrial cluster. First, Potter (1998) emphasizes the geographic concept of industrial cluster “among a certain particular field (usually there is a leading industry as the core), a large number of enterprises with close industrial contact and the relevant supporting organizations cluster and give rise to the phenomenon of powerful and sustainable competitive advantage.” Second Rolelandt (1998), whose definition of industrial cluster emphasizes the economic connotations, “it refers to the network formed by strongly mutual dependent enterprises, knowledge producing organization, intermediaries and clients with close value-added chains, in order to gain the new complementary technology, obtain benefits from complementary assets and utilizing knowledge alliances, accelerate learning process, reduce transaction cost and make cooperating economic benefits.” In this paper we mainly lay our emphasis on the geographical meaning of industrial cluster and give consideration to its economic meaning at the same time.

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There are a lot of different forms in the forming of industrial cluster, depending on its intensity of depth and complexity. Generally speaking, there are three kinds of modes in the forming of industrial cluster.

The first mode is the one created by the market. That is, there is a specialized market in the range of regional economy at first. Thus, it creates important market transaction conditions and information conditions for the forming of industrial cluster, and finally makes the production process assemble near the market. It is in Ningbo, Wenzhou of Zhejiang Province that this mode forms the typical area where the industry gathers. The second mode is formed by FDI (foreign direct investments). This kind of industrial cluster is formed relative to capital circulation. The main method is to absorb the foreign capitals. In certain fields, several large-scale multi-national corporations will attract more foreign businessmen to invest a large number of enterprises. Thus it helps to form the customers' chain of the multi-national corporations, and then it will drive the development of all kinds of industries in the locality. The typical area is the "pearl trigonometry" and the "long trigonometry" area. The third mode is the endogenous brand enterprise oriented mode that will be studied in this paper. It is that a large number of enterprises with high competitiveness form the manufacture base of the industry, and then drive large quantities of relative projects "flock together". The industrial gathering of Haier electrical home appliances is the typical mode of endogenous brand enterprise oriented mode.

In foreign countries, the beginner of research on industrial cluster is Marshall. Marshall (1920) studied the aggregation of enterprises based on external economies. He found there was a close relationship between external economies and industrial cluster, so he believed that industrial cluster was resulted from external cluster. AldoRomano and Giuseppina Passanate (2001) proposed to use the ideas of organizational adjacency instead of geographic adjacency. They believed that the organizational adjacency was new cause of industrial aggregation, which extended the geographic space for industrial cluster.

In China, the industrial aggregation appeared for more than one thousand years (such as Jingde Town, which has a history of 1400 years and has been famous for its pottery and porcelain), but serious researches on it began after the China's reform and opening up policy (in the late 1970s), and developed quickly since 1990s. Many researchers proposed their own theories from different perspectives. YANG Guang (1996) held the idea that innovation was the elementary cause of the industrial aggregation. XU Re-xiang (1998) studied industrial aggregation in terms of cost, demand and environment. WEI Shou-hua (2002) did researches based on the regional economic development. ZHANG Guo-an (2004) emphasized the role of high-tech industrial zones in its forming.

There are plenty of researchers with their theories and researches. However, there are few about researches systematically dealing with only one enterprise and cluster around it. Taking Haier household electrical appliances as an example, this paper is trying to analyze one particular pattern of Chinese industrial cluster. What's more, the paper is trying to find out that the advantages and defects of this mode and put forward suggestions accordingly.

2. The Development of Haier Household Electrical Appliance Industrial Cluster

The process of industrial cluster is not accomplished in one move, but in a progressive course. We can classify the industrial cluster of Haier into three stages according to its different tactics in different periods.

The first stage (1984-1991), the industrial cluster of Haier electrical home appliances was at the stage of

simple and geographical gathering. That is, Haier and other enterprises are in the state of spontaneous gathering, without forming steady economic links with each other, and the scale and externality of the cluster have not been reflected. In 1984, the predecessor of Haier Group, Qingdao General Refrigerator Factory was established. Under the leadership of ZHANG Rui-min and the guidance of “famous brand strategy”, Haier grew into a famous electrical home appliances company of China rapidly, starting from a collectively owned factory with a deficit of 1 470 000. The constant enhancement of Haier’s capability has attracted some relevant enterprises to gather in Qingdao but the steady relation has not been formed yet.

The second stage (1992-1998), the industrial cluster of Haier electrical home appliances is at the stage of network contact. At this stage, an intact industrial chain of Haier electrical home appliances industry has taken shape gradually, with Haier as the leading factor and the entry of other relevant enterprises. At this stage, the electrical home appliance of Haier starts the attempt of industrial cluster earlier. The big enterprise and famous-brand effect of Haier has attracted many relevant upstream enterprises to set up factories near Haier one after another. Through high growing rate during these years, Haier electrical home appliances corporation has built up a strong industrial gathering platform already by 1998. For example, the enterprises that provide raw materials reached the number of more than 2 200, assuming the air of a huge industrial kingdom. Meanwhile, relying on this strong industrial gathering platform, Haier takes the leading position in this cluster and gets the right of saying. In this way, a network industrial chain takes shape tentatively with Haier as a leading factor.

The third stage (1998-), the industrial cluster of Haier electrical home appliances is at the stage of innovative development. At this stage there is a close network formed among enterprises of the cluster and between enterprises and intermediaries with countless pieces of nodes. The cluster is carrying on the technological innovation, organizational innovation and then developing constantly. In 1999, Haier group set up a new department to promote logistics. As an important link of Haier’s Business Process Re-construction (BPR), the logistics reforming starts according to the principle of selecting the superior and eliminating the inferior, and Haier optimizes the existing network of suppliers in the world through internet. It makes international and professional enterprises suppliers for Haier and eliminates the inferior suppliers. Therefore the number of Haier’ suppliers reduces from more than 2 200 to 721, but quality is promoted greatly. Among present suppliers, 59 are world top 500.

3. The Features of the Haier Household Electrical Appliance Cluster Mode

From the development of Haier household eclectic appliance convergence, we can get the message that this mode not only has something in common with other modes but also has many particular features, which characterize the Haier mode, accelerate the development of Haier group and improve the competitiveness, establishing Qingdao household electric appliance cluster one of the top three clusters in this field in China.

This paper is trying to summarize the features as follows:

3.1 As to the forming mode, Haier household eclectic appliance cluster is endogenous brand cluster pattern.

In the area of Qingdao, Haier Group is an anchor firm. This key enterprise derives, innovates and becomes “the touching factor” of the area of Qingdao. It attracts enterprises dealing with raw materials, spare parts, and auxiliary products. Together with the upstream, middle, and downstream enterprises, they form large scale production, producing strong overflowing effect to push the economic development of the area greatly. Among

Haier industry optimization process of chain, one invisible industry economic zone gradually takes the shape with Qingdao as saucer. Besides the upgrade of spare part of manufacturing industry, the funds flow, talents flow and the management ideas directly or indirectly influence a lot of aspects of economic construction of Qingdao and even Shandong Peninsula.

Industrial aggregation can not only guarantee the leading position of industry's technology in fields of electrical home appliances of Qingdao, but also increase the technological contents of the products and keep its own development advantages. What's more important, it has developed the manufacturing industry chain of Qingdao and even of the Shandong Peninsula. The whole Qingdao and even peninsula manufacturing industry will get on this "express train" going to this high-quality industry chain.

In 2002, the gross output value of the electronics and information industries in Shandong Peninsula is 117.855 billion Yuan, accounting for 8.68% of the whole country. The total profits of the electronics and information industries in Shandong Peninsula are 2.73 billion Yuan, accounting for 5.58% in the whole country. Details are as show in the table below.

The indices of electronics and information industries around Bohai Sea in 2002

Region	Industrial value (billion)	Percentage in the country (%)	Sales (billion)	Percentage in the country (%)	Profit (billion)	Percentage in the country (%)
Beijing	109.28	8.05	810.1	9.83	42.10	8.61
Tianjin	94.28	6.93	712.7	8.65	80.00	16.36
Hebei	12.09	0.88	77.81	0.94	5.44	1.11
Liaoning	40.105	2.95	236.85	2.88	7.03	1.44
Shandong	117.855	8.68	734.84	8.92	27.28	5.58
Total	373.277	27.50	2572.3	31.23	161.85	33.10

Data sources: Business operation branch of information industry department, 2002.

3.2 Haier household electrical appliance cluster is typical of multi- brands. Many famous brands such as Sayon and Emerson gather around Haier group for reputations of Haier group. The brand effect of Haier is the basis of the Haier household electrical appliance chains its industrial cluster.

From the very beginning, leaders of Haier carry out "famous brand strategy" and put much emphasis on the "brand effect". During its development process, leaders of Haier hold the ideas that brand is the result of market competition, the core of which is to establish triangle relationship with customers and to establish reputation, reliability and praise of the customers. Besides, during the process of establishing brand in name, leaders of Haier put as much as emphasis on establishing brand in product quality, trying to guarantee its products are worthy of their name. The brand effect does bring Haier rich returns. At domestic market, according to the statistics of Zhongyikang Company, Haier is qualified the first brand of China and the whole share on the Chinese electrical home appliances market has already come up to 21%, leading the rival greatly. Haier is the only one in China that was selected by one of the world five major brand appraisal agencies as one of the "world 100 most influential brands", ranking the 95th. In 2004, global turnover of Haier goes up to 100 billion Yuan.

It is the band effect of Haier that attracts suppliers to build factories around Haier, because brand effect gives investors confidence in long-term development and cooperation. For example, the Sampo Company invests in Haier compressor factory because it has confidence in reputation and technology strength of Haier. The industrial chain and industrial cluster of Haier household are based on Haier brand. During the process of the industrial cluster, leaders of Haier carry out the "famous brand strategy", not only emphasizing the brand

itself but also the brand effect of the whole industrial chain. In 1999, Haier Group set up a new department to promote logistics. As an important link of Haier's BPR, the logistics reforming starts according to the principle of selecting the superior and eliminating the inferior, and Haier optimizes the existing network of suppliers in the world through internet. It makes international and professional enterprises suppliers for Haier and eliminates the inferior suppliers. There upon the number of Haier' suppliers are reduced from more than 2 200 to 721, but quality is promoted greatly. Among present suppliers, 59 are among the world top 500. Then Haier household electrical appliance cluster have become a multi-brand cluster with Haier as its leader and the industrial cluster has entered the stage of innovation.

3.3 During the process of Haier household electrical appliance cluster, industrial zones play an important part.

In the process of cluster, Haier has many industrial zones with their own characteristics. Now it has ten industrial zones, including eight domestic zones, five in Qingdao, the other three in Wuhan, Hefei and Dalian respectively, two foreign industrial zones, one in USA and one in Pakistani. Of all the parks, the largest one is in Carolina, the south part of the USA. Haier industrial park has three features: advanced products, modern management and green environment. Haier (Jiaozhou) international industrial is another internationalized industrial park and base for the R&D and production of spare parts of Haier group. Haier Development Zone Industrial Park is positioned to aim at international market and produce advanced products of world level and finally is the base for the export of electronic home appliances. Haier IT Industrial Park represents Haier's strategy of entering into IT filed. There is Haier logistic warehouse, IT household electrical appliance manufacturing base, advanced moulds, workshop controlled by electronics and Haier University in the industrial zone.

In these industrial zones, investors can enjoy main preferred policies. The industrial parks have several advantages for investment, such as favorable location, business environment with low risk, world-class fundamental devices, human resources and living environments. Those factors decrease the cost and risk of carrying out of a business so that it causes a centralization of those industries. Industrial zones, not only work as growing points and motivation for clustering industrial aggregation, but also play an important part in the further development of the industrial cluster. Thus, emphasis on the industrial building is essential to the smooth development of industrial cluster.

3.4 The cultural network of the group with characteristic of innovation.

Haier has formed its own unique innovative corporate culture in the course of its own development. The slope spheroid management theory of Haier and the management idea that pursuing more outstanding than maintaining what has achieved are two typical examples. They respect work, serve the motherland pursue being outstanding. The management mode that everything is finished everyday and everyday is better is another example. The novel corporate culture makes Haier have enormous strength and develop into international known brand.

Moreover, the overflowing effect of electronic electrical home appliances collecting group helps form the culture network. Take Mr. QIU, director of the Huarun Electronics Co., Ltd for example. Though the company has a short history of four years, the company's annual output is rising every year, reaching 173 million Yuan in 2002. As an electronic spare part sub-supplier of Haier, the growth of is undoubtedly from Haier. However, Mr. QIU thinks that flourishing upward enterprise is more important. He says, "Having cooperated with Haier for a long time, my company has been greatly affected by Haier, especially in the fields of speed, innovation, SBU.

Haier not only puts up the platform of wealth for our enterprises, but also puts up the platform of a creation success.”¹

4. The Defects of Haier Household Electrical Appliance Cluster

Haier household electrical appliance cluster is a successful case in China, promoting the further development of Haier group and local economic development, but there are also some factors preventing the further development of the cluster.

4.1 In the value chain, the manufacturer of the electrical home appliances is in position of low income, low rate of return on investment and the relatively high cost to build up the factory. It is a negative factor in the development of industry cluster.

The majority of the enterprises in the cluster are located in the position of processing, assembling in industry's value chain with low income. Depend on producing and assembling, the scale of enterprise expands and the centralized benefit will come into force. There are few enterprises focusing on the aspect with high-centralized benefit including research-development and sale. There is lack of original high-tech products in industry cluster of Haier and profit ratio is obviously less than the industry cluster of other areas. For instance, in Suzhou, the rate of return on investment of advanced electronic industry is generally 25%-50%, and the number of the industry of the accessory and part is about 25%. However the rate of return on investment of electrical home appliances industry in Qingdao is generally in 5%-10%, the industry of the accessory and part is generally below 5%. So there is lack of hierarchy and industry structure in the area distribution, and vertical and specialized ability to supply accessories and parts. The industry cluster has not reached the status of “Japan and Korea in the south, southern Jiangsu in the west, to central China in the north”, which will bring industry gathering and investment. Without scientific and technological industries gathering, around “three big” (big enterprise, big project, big base) there are relevant industries' gathering, related function district of products and domestic medium and small enterprises producing accessory and part. Under this circumstance, a large quantity of accessories and parts cannot be supplied by local enterprise, and the majority of products are still produced by SDK. The matching rate of products is relatively low and the matching rate of accessories and parts is less than 20%. And the main suppliers of Haier are distributed in Zhejiang, Jiangsu, etc. Even some key parts are imported from abroad mainly. So all these factors influence the forming rate and scale of industry cluster of Haier electrical home appliances.

4.2 The cooperation between Haier group and two other household electric giants in Qingdao is insufficient^[6]. Haier, Hisense and Aucma are the top three biggest enterprises on the household electric appliance in Qingdao. If they cooperate with each other much more, it will not only facilitates the development of Haier electric appliance as a cluster, but also promotes the competitiveness of Qingdao as a whole, attracting more related firms to Qingdao and promoting the industrial cluster of electric appliances in Qingdao. However, the cooperation is not sufficient. They have little communication, no atmosphere of cooperation and no channel for the affective circulation of information, technology, capital and talents, so that they cannot create the outcome of 1+1>2. Under this situation, the enterprises within the electrical appliances cluster cannot make full use of the recourse and advantages of the entire cluster. It does no good for the industrial cluster of the electric appliance in Qingdao, as well as Haier.

¹ Chinese Customers Newspaper, 2nd section, November 11, 2002.

5. Conclusion

Haier industrial cluster of eclectic appliance is a special model of industrial cluster in China. In terms of its forming process, it is the endogenous brand model. This brand enterprise is Haier group. After 21 years of development, Haier group has developed from a little firm that had deficit of 1.47 million Yuan to a worldwide famous group with global turnover of 103.9 billion Yuan. Haier industrial cluster of electrical appliance becomes stronger and stronger depending on three stages. They are stages of simple geographical convergence, the stage of network contact and the stage of innovative development. To a certain extent, Haier is no longer a simple enterprise, but as the industrial convergence supports the economic development of Qingdao, elevates the competitiveness of Qingdao city and even the entire Shandong Peninsula. Its influence doesn't limit to this. Nowadays, convergent economy has significant importance in the global economy. Therefore, it is essential to make a research on the development principles of industrial convergence to region and enterprises. The brand strategies in the development and BPR, the creative and original enterprises culture are important reference to any other industrial convergence.

Though Haier's household electrical appliances industrial cluster is a comparatively successful case, there are still some shortcomings restricting the further development of the group. As for these shortcomings, we have come up with the following suggestions:

5.1 Form an advantage in technological creativity. In order to deal with the ever-upgrading needs of the clients, companies in the market chain with Haier as their center must as a whole enhance their technological creativity in the products. Companies do not only need to study the core techniques, high-grade exterior appearances, and characteristic functions of the high-end products, but also need to know about the supplying company's technological condition and the promotion situation in the marketing channel. Based on the trust gathering by effective communication with the supplying companies and the marketing channel, companies should get some knowledge and feedback of the needs in the market. After improving each part that affects the efficiency of the market chain, engage in new products together with them, so as to increase the work flow quality of the company, including the manufacturing of those components needing constant redesigning and change, the creative service and marketing methods. We also need to increase the extra value of the whole industry, lower the cost for coming to set up factories in Qingdao, and enhance Qingdao's ability to provide the auxiliary items, so as to make Qingdao more attractive and promote the development of the industrial cluster.

5.2 Perfect the cooperative mechanism between the industry, the universities and the R&D. Besides intensifying the creativity mechanism of the household electrical appliances companies, the more important for the creativity of the household electrical appliances industry is to set up an interactive model between the industry, the universities and the R&D, encourage the cooperation between creativity bodies, break up the division, and pull down the fences between the industry, the universities and the R&D. The specific measures are: companies in Haier's household electrical appliances industrial cluster can build directional relation with local universities and R&D, and improve their cooperation in talents training and technological creativity. Through this model, companies within Haier's household electrical appliances industrial cluster can achieve an interactive, mutual beneficial and benefit-sharing relation within the universities and R&D departments.

5.3 Promote the cooperation with other big household electrical appliances companies, especially Aucma. The "fight by oneself" pattern should be changed, and we should raise the consciousness of the brands as a whole

(to be continued on Page 60)