

THE TRACING RESEARCH OF INDUSTRIAL LOCATION

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ABSTRACT: At present, China's economy develops very quickly and displays very bright future with the transformation of its development strategy from extensive production and management mode to the intensive one. There is no doubt that industrial relocation as a long-term task has all round meaning and strategic significance both in capital construction and industrial renewal and remake to achieve such a strategic transformation. In this paper, the authors gave a general study on the Chinese industrial relocation in the light of the theory of industrial location and relocation and discussed five types of industrial relocation concerning factory development in scale, site and organization in China: factory-expanding, factory-converting & renovating, factory-removing & migrating, industry-substituting in a region and trace-reutilization of a factory.

KEY WORDS: industrial location, industrial relocation, dynamic process of industrial location, industrial development, location research

I. INTRODUCTION

At the beginning of the 1950s or even earlier, some scholars in U. S. A. , Britain, Japan and other Western countries started to use such terms as “industrial relocation” or “redistribution” and discussed them (Isard, 1960; Estall, 1966; Clark, 1983). In 1990 and 1992, we put forward the “Theory of Industrial Relocation” (Shi, 1990, 1992), considering the dynamic process of industrial activities in space and tracing research of industrial location as the mainstay of the theory. Here again, in this paper, we will discuss some problems concerning tracing research of industrial location in the light of China's specific conditions.

II. THE URGENCY OF THE TRACING RESEARCH OF INDUSTRIAL LOCATION IN CHINA

A socialist industrial system with relatively independence and complete segments has been established since 1949 and various kinds of activities of industrial locations have been put into practice in far nearly everywhere in China to meet various local conditions, which greatly enhanced Chinese economy.

Since the 1980s, the Chinese government paid much attention to the intensive industrial development mainly by means of technique reformation. For example, in this decade, China invested more than 463,000 million yuan (RMB) in the technique reformation of industrial enterprises, the amount is 2.6 times as many as that of the previous 30 years after the founding of the People's Republic of China. In the 1990s, the central government is trying hard to transform its industrial development mode from extensive to intensive, which means we not only depend on constant operation of extensional enlarged reproduction and strive for new locations and new-established enterprises to acquire a much quicker developing speed as before, but also resort to intentional enlarged reproduction mode including factory-renewing, factory-remaking, factory-reforming, factory-expanding, factory-converting & renovating, factory-merging, factory-closing, even factory-moving & migrating concerning scale-enlarging, organization-readjusting, location pattern-changing as well. Only in this way, can China give a very good combination of making full use of its existing industrial enterprises or industrial bases and establishing new industrial enterprises to carry out its new industrial development strategy smoothly. There is no doubt that industrial relocation is one of the most effective meanings to deal with such tasks.

Like any other things in the world, industrial location, too, has its own history and process of origin and development. Conceived in the capital construction and based on the locational factors and conditions, industrial location will never stick to its original form and is not immutable. After a few years, the subjective & objective environmental factors and conditions (esp. various locational factors and conditions) which make the survival of the industrial location possible will change inevitably, thus result in the process of improving, adjusting and evolving the original industrial location. This dynamic process of industrial location is called industrial relocation. If we say the original industrial location is supported by the expounding and improving and decision-making of the original location factors and conditions, then we can conclude that industrial relocation results from the tracing research and decision-making of the changed locational factors and conditions.

With the constant change and movement of industrial locational factors and conditions, we are required to make a continuous pursuit in the industrial location patterns in a fixed period (five or ten years) or in an irregularly scheduled period to make sure that if there are major

changes happened, and furthermore, we can offer scientific proof of how to make decision of the reproduction of industrial fixed assets and capital construction and technique reformation of industrial relocation. It is an incorrect idea that the new industrial construction relates to the industrial location, but the extension, reconstruction, removal and transformation of industrial enterprises has nothing to do with the industrial location, which is of much great significance to China in particular.

II. THE PRACTICE OF THE INDUSTRIAL RELOCATION IN CHINA

Briefly speaking, there are five types of industrial relocation need to be given the first considerations in the field of locational tracing research in the light of China's specific condition.

1. Factory-Expanding

Generally speaking, if conditions permit, in order to increase productive scale factories can be expanded once or many times by means of making an additional fixed assets investment, extending factory buildings, adding equipment, increasing numbers of workers and so on, which may always result in better profits—little input, much output. This is one of the most common types of Chinese industrial relocation. Of the “156 Priority Projects” constructed in the First Five-Year Plan of China, most have been expanded one or more times and have been essential parts of their corresponding segments and occupations still in China and need to be expanded with the change of locational conditions, especially markets and so on.

The locational conditions of the Anshan Iron & Steel Company established in 1916, the largest iron and steel base in China once, have been changed greatly with extension and renewed transformation of several times especially with the launchment of China's open-door policy. It still has a large potential in extension and transformation to expand its comprehensive production volume by occupying much broader markets at home and abroad and by using its own good resource combination advantages and good location or even foreign resources and other possible conditions. Now, it aims at the 10 – 15 million tons comprehensive production capacity with excellent quality and various kinds of iron and steel.

There is a demarcation line in such an expanding. We can not go beyond the limits and possibilities offered by the main factors and conditions including that of industrial location. If we expand a factory blindly like rolling a snow-ball only on behalf of each segment and region alone instead of that of the whole country, we will be confronted with a lot of troubles—the radii of raw materials and energy resources becoming longer and longer, the selling market of products becoming farther and farther even to go beyond reasonable limit, so that such fundamental installations as water, transportation, electricity and the public services are in short sup-

ply; environmental pollution becomes heavier and heavier, which may result in endless trouble in economy, society and ecology.

Different from establishing a new factory, we should do at least two important things in advance in decision-making of factory-expanding: one is to make an actual and precise tracing study on the location conditions compared with the earlier locations when the factory was established to find the difference, the other is to evaluate the current status and the potentialities of the factory. How to make full use of the established economic base of the factory and go beyond of the benefit-seeking of short-term is a complex and difficult problem in such a study.

2. Factory-Converting & Renovating

Being very different from factory-expanding which is mainly for the sake of enlarging production capacity, technique reformation which mainly means renewing the fixed assets and reforming and renovating the technology of a factory always falls into the category of intentional enlarged reproduction. By means of adopting advanced techniques and new equipment increasing labour productivity, the main purpose of it is not only to improve the quality of products, increase varieties and specifications of products, accelerate the upgrade and shift of products and enlarge production capacity, but also to get such a series of synthetic beneficial results as lower consumption of energy resources and raw materials, the intensification of the complex utilization of resources and harnessing environment. With the strategic transformation of China's industry towards intensive production and management, factory-converting & renovating increasingly becomes more and more important and more and more popular because it is more workable in practice.

In doing such a thing above, expounding and proving in technical economy or feasibility study must be carried out carefully, a good tracing study of potential of original locational conditions and evaluations of the established factory's base should be certainly included in the decision-making. We have to sift out one of the best alternatives from building a new factory, expanding or removing a factory and other kinds of technique reformation. In fact, factory-converting & renovating is always in perfect harmony with factory-expanding in practice. It is widely used in revitalizing most of the factories established in "the Third Line Construction" and the old-established factories in the old industrial bases or cities and rural-town industry. Let's take Chongqing Heavy Castings & Forgings Factory (CHCFF)—a very important large-size backbone factory of China General Shipping Co. Ltd—as an example. In the early 1980s, the CHCFF found itself in a tight corner because of their very poor product varieties and quality and market possessing rate and old-fashioned machinery equipment. After a very good survey of market and a scientific study on the locational conditions and so on, they invested 36 million yuan (RMB) to produce open wagon and achieved great success. It established a factory

with a capacity of 2000 open wagon by using the original locational superiority and some of the machinery equipment and factory-building and produced its sample open wagon in the same year, the CHCFF develops very smoothly from then. The other typical example is the Sichuan Changhong Machinery Building Factory. This factory, located in Mianyang City, a small city in Sichuan Province, was once a military factory producing war products mainly. After 1978, with the tide of economic construction of China the main products of it has very limited markets. By making full use of its good machinery equipment and high-quality personnel, the boss of the factory decided to change the line of production to produce TV set which was very needed in China's market after a tracing study on its locational conditions. The factory was managed to do so and now becomes the most important and the biggest colour TV set production base of China.

3. Factory-Removing & Migrating

If all conditions permit, factories suitable for expansion or renovation ought to be expanded or renovated, which may result in the increase of product output and the improvement of product quality. If drastic changes of dominant locational factors and conditions come about, and the locational disadvantages have superseded locational advantages, or it is impossible for the factory to survive in its current location because of the evident decrease of its benefit, the only thing we can do is to close down, suspend, merge with other factories or change its line of production (we briefly call them "C. S. M. C." in the following), which makes the original form of the location of the factory disappear. In the middle 1930s, because of the breakout of "the War of Resistance Against Japan" the Kuomintang government carried out the biggest factory-removing & migrating activities from east coast China to the southwest China historically in order to meet the need of the War. Up to 1940, there were at least 452 big & middle-size industrial enterprises including 120 thousand ton equipment and 120 thousand technical personnel supported by the government removed to the inland, of them machinery, chemicals, and electrical equipments were the mainstay, which greatly enhanced the economic development of West China (Wu, 1995; Zhou, 1986). In the middle of the 1960s "the Third Line Construction" was carried out on the basis of national defences, the central government planned to remove the first 214 important factories including its machinery equipment and personnel from east coast China to the Third Line Areas (Xiao, 1989). Because of very bad locational conditions and decision-making process, more than half of such removed factories suddenly found themselves in a very difficult conditions. They were established in the mountains or in the man-made big holes of mountains, the infrastructure was in great shortage, it was very difficult for them to transport their raw materials and products, to contact with other workshops of its own or with other factories (Wu, 1995). From the 1980s the government began to adjust such a lo-

cational patterns above, some factories were moved to a near and good site with relatively good location conditions. When the 1990s comes, Beijing, Shanghai, Tianjin, Shenyang and Dalian of Liaoning Province, Nanjing in Jiangsu Province, and other big cities began to redefine their functions and readjust their city plans to meet with the development of cities. A great number of factories in the central places or business centers were forced to migrate to the suburbs or even far more the provinces. For example in Dalian City, more than 20 factories were removed out of the center city in 1995. In Beijing, about 380 factories were removed or will be removed to the outskirts from the middle of the 1980s.

4. Industry-Substituting in a Region

The modern industry segments are very complex in terms of the interrelationship of them. When locational inferior position of a concrete location of one kind of factories comes, often the locational superiority of other kinds of industries show up in the same region, substitute industries then replace the original ones gradually. For example, Fushun City in Liaoning Province once was a very important coal resource and coal production base. With the gradual demolition of coal resources and increasing intensification of synthetic utilization of coal resources, a complicated industrial structure with such high-energy & raw material-consumption segments as coal, oil, electricity-generating, steel and aluminium as the mainstay was established gradually, coal industry was substituted by others by degrees. In order to get rid of the troubles of higher-energy-consumption and low efficiency and low profit, Fushun's industrial structure is adjusted or reconstructed towards a new and complicated pattern with oil-processing, petrochemical, light and textile industries as the mainstay.

Since the 1960s, Daqing has been the largest oil-field in China. It's output of crude oil accumulated more than 120,000,000 tons, ranking the eleventh in the world. It has been producing crude oil 50,000,000 tons per year continually for 19 years. Now, Daqing has been one of the most important petroleum industry base with oil recovery, oil processing, petrochemical as the mainstay of its industry structure of China, confronting with the serious problems of gradual deminishment of oil field and single industrial structure in a long-term. From 1978, the city government advanced a grand plan to transform the single industrial structure to a complicated industrial & economic structure with various other new industries to deeply make full use of rich resources and advanced technology. Now, Daqing is paying close attention to such industries groups as: a) mainstay group including petrochemical, textile of chemical fibre and plastic industry to utilize oil & gas resources deeply and synthetically; b) related service group including building materials, machinery, electronics and instrument-making and high-tech industry; c) group giving service to people's daily life including clothing, food and beverage and various service industries; d) big agricultural industry group; and e) tourism industry. There is

no doubt that Daqing is making big stride towards a more bright and attractive future.

5. Trace-Reutilization

One of the most important content of industrial relocation pursuit is how to make full use of “trace” after the factories are closed-down, suspended, merged with other factories and so on. Besides the continuous utilization of substitution industries above, other industries including the tertiary can be selected to utilize these factory traces. For example, Beijing Wrist Watch Factory, once a good and important factory in Beijing, was located nearby the third belt highway and got in great trouble with the old-fashioned products and increasingly decreasing market and very heavy welfare problem with retired workers and so on. Several years ago, this factory was closed, a famous big business enterprises——Beijing Dongan Group brought all the things of the factory and established a big modern shopping center in the original site of the factory and made a remarkable achievement in its business by reutilizing the good location. Such kind of examples is increasingly more and more in the old city reformation of big cities like Beijing, Shanghai, Tianjin, Nanjing, and so on, or in the cities with rich natural or mineral resources like Fushun in Liaoning Province, Daqing in Heilongjiang Province, Datong in Shanxi Province and so on.

In a word, we have to shift out the best project by locational analysis for agriculture, business, tourism, or other industrial segments. And we must use such a kind of land carefully, and these traces will become the valuable land of industrial relocation.

III. SOME THEORETICAL SUGGESTIONS ON INDUSTRIAL RELOCATION

Now that industrial location is a dynamic process of evolution, the research of industrial location ought not to be only “one time” and not to be accomplished at one stroke. Once the location of industrial activities turns up, we have to follow the heels of them to make a further detailed dynamic study continuously to find out the problems as soon as possible and then resort to all kinds of methods.

In the authors’ opinion, industrial location, in a broader and more perfect sense, includes original industrial location and industrial relocation (that is the continuance and development of the original industrial location), their relationship are shown in Fig. 1.

Apparently, there are similarities and differences in the research and practice of industrial location and relocation. Their final purposes are to make a synthetic expounding and proving of the location factors and conditions and to pass judgment on the industrial locations in order to serve the scientific decision-making of industrial locations, both of them fall into the category of industrial location in broad or common sense. Offering these two ideas, two formulations and

concepts of industrial location and relocation, is very helpful to make a further pursuit on such a complicated problem, to find out the evolving laws and characteristics of the two-way movement of the extensive and intensive industrial location in the dynamic process of the movement of industrial activities, to deepen the expounding and proving of location factors and conditions and the optimization of decision-making, and furthermore to lead the scientific work of industrial location into a deeper position.

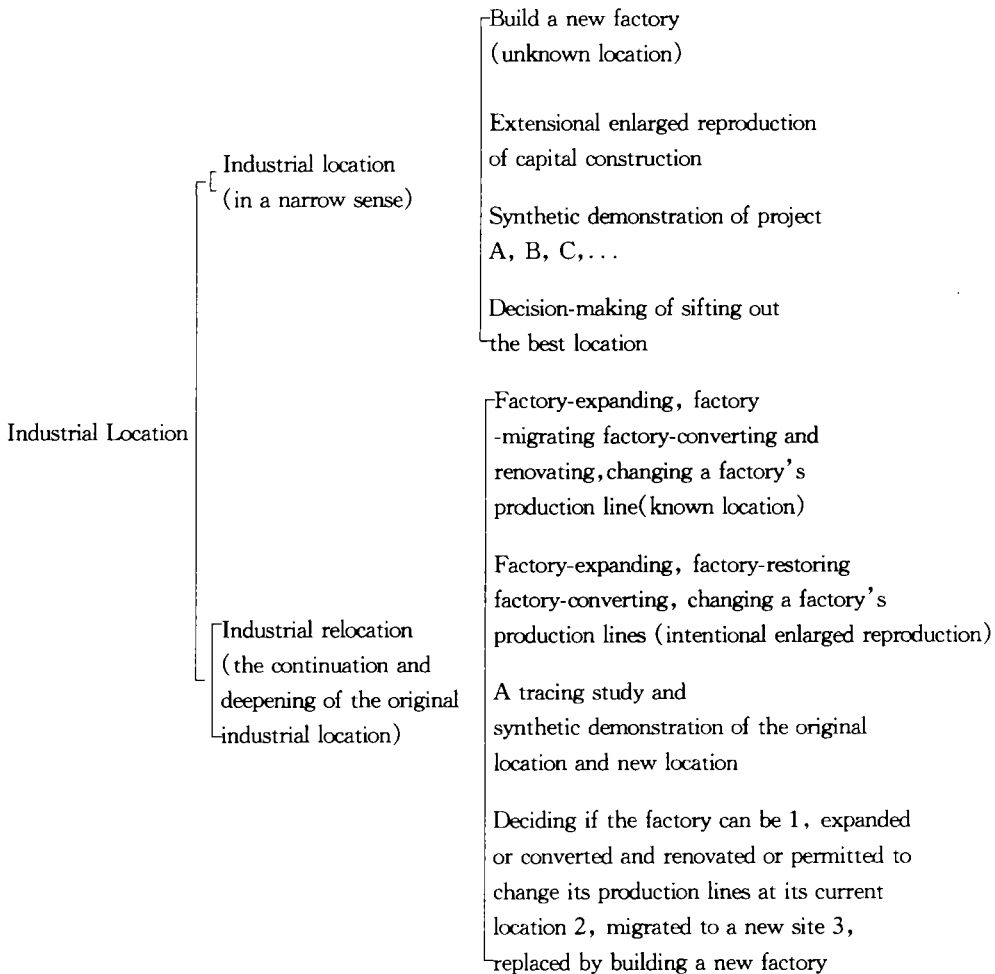


Fig. 1 The differences and similarities of industrial location and relocation

Some old industrial enterprises and bases in east coast China, Northeast China and some interior areas has a long history and give much great contribution to the development of national economy. Because we did not give much consideration to the technique reformation in the planned economy and had little press and incentives to do technique renewal and reformation, these enterprises “hold the same products all along in decades” and have very poor competitive

power in the market and lower economic benefit, which limited the utilization of locational superiority and so on. It is very urgent and important to revitalize these enterprises by means of effective methods including industrial relocation.

In our opinion, the methodology of industrial location and relocation is not only suitable for understanding the location and relocation of single industrial enterprise, but also suitable for discussing or considering industrial territorial organizations or patterns like industrial points, industrial districts, industrial junctions, industrial areas or even industrial zones, which is simply because the locational or environmental conditions of such industrial patterns are not invariable at all and they also has a process of its formation and development and may confront with the same problems or difficulties as the single industrial enterprise does and therefore need the same method to deal with.

The same methodology can also be developed or extended into the whole field of the location of the productive forces because the location of the productive forces itself is a dynamic process of continuous development and evolution including extensive location and intensive location. In this crucial period of the transformation of China's national economic strategy from a relatively extensive enlarged reproduction & management to a intensive one, it is very important to deal with the relationship of the extensive location of the productive forces and the intensive one in the light of China's current conditions. So, we have to open mind, make truth from facts, draw on the experience of other countries, and contribute earnestly to summarize the useful experiences and lessons of China industrial location and relocation in the recent decades and try to give full play of the methodology to the practice of China's economic construction.

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