

## Inspiration of German Ruhr to the Revitalization of the Old Industrial Areas in Northeast China

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### Abstract

In order to explore the development of the old industrial areas in northeast China, firstly, some basic concepts of the old industrial areas are introduced from basic definitions and features. Secondly, an empirical research is carried out, including the analysis of regional characteristics of the old industrial areas in German Ruhr, and decline of economy and traditional industry in German Ruhr industrial area. At last, the inspiration of German Ruhr to the development of the old industrial areas in northeast China is discussed. The results showed that the cases of Ruhr area transformation can provide useful suggestions and ideas for the revitalization of the old industrial areas in northeast China. Based on the above findings, it is concluded that the experience of German Ruhr is helpful and the old industrial areas in northeast China can be inspired by German Ruhr and eventually achieve the goal of revitalization.

### Keywords

German Ruhr; the old industrial areas in northeast China; inspiration; revitalization.

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### 1. Introduction

Since more than half a century of the reform and opening up, China is experiencing a historical period transforming from a planned economy to a market economy. This transformation is a great challenge to the economy of all regions in China, especially to the old industrial base in northeast China. In recent years, the northeast old industrial base has been trying various ways and innovating and developing by different means [1]. There are certain effects, but they are not very ideal. How to make the old industrial base adapt to the system transformation as soon as possible has become one of the driving forces of China's economic development once again. And it has become a focus issue of China's economic development. It is urgent to realize the transformation of the old industrial base in Northeast China.

The revitalization and development of the old industrial bases is not a temporary economic problem that occurs occasionally in a certain time or space, but a specific general problem. In fact, this problem has appeared in some western developed countries earlier. For example, the "rust belt" in the United States, the Ruhr in Germany, and the old industrial zones in both Britain and France. Among them, the Ruhr of Germany is a case of the decline of the old industrial base in the textbooks of the world economic history [2]. At the same time, the region is also famous for its stunning results. Therefore, the experience of successful transformation of old industrial bases in developed countries is worthy of research and reference for the transformation of a world old general industrial base. In order to realize the transformation and revitalization of the old industrial base in China, the German Ruhr old industrial base is to be studied. At the same time, some policies taken by some of the German federal government

and the local government to achieve the revitalization of the old northeast industrial economic zone are worth careful studies.

With the continuous advancement of China's industrialization process, the problems of the transformation and revitalization of the old industrial base have been paid more and more attention to buy more scholars in the near future. Under the background of China's economic transformation, it is necessary to further study the development of old industrial bases, and find some characteristics and rules, which will be necessary for the revitalization of our old industrial economic zone and the coordinated development of regional economy. In this paper, firstly, some basic concepts of the old industrial areas are introduced from basic definitions and features. Secondly, an empirical research is carried out, including the analysis of regional characteristics of the old industrial areas in German Ruhr, and decline of economy and traditional industry in German Ruhr industrial area. At last, the inspiration of German Ruhr to the development of the old industrial areas in northeast China is discussed.

## 2. Concepts of the old industrial areas

In the west, the old industrial economic zone mainly refers to the geographical concentration of some heavy industrial sectors, such as the industrial raw materials department, the textile department, the automobile manufacturing sector and so on. After a period of development and reaching its peak, these centralized economies all appear to be economic "aging" or even rigid symptoms of different degrees [3]. That is, the failure of regional economic flexibility and self-adjustment cannot be adjusted according to the changing external conditions. Since the middle of 1950s, structural adjustment in the economic range has resulted in that many European countries and regions are suffering a serious economic decline and unemployment rate rising. Ironically, these countries and regions are all the forerunners of the industrial revolution, but now they have to move to other new economic growth points. In this process, those areas with coal, iron and steel, heavy machinery, textile and shipbuilding and the "chimney" industry as economic dominant, suffered particularly badly attack [4]. The power source of economic growth has disappeared, and the problem of unemployment is serious. The aging and ossification of the old industrial zone is a common problem faced by the countries and regions that have entered the industrial and postindustrial stages. Why the old industrial zone cannot adapt to the new environment, why it is unable to develop new products, why the former specialization cannot meet the needs of the market, for the above issues, different theories give different answers. Though these theories may be incompatible with each other, in a sense, these theories reveal the fact that, under certain conditions, the operation of the market and the market sometimes cannot avoid the aging and fossilization of the old industrial area.

The problems of the old industrial area has been widely mentioned in the industry organization theory, regional economy, and the technological and social changes theory [5]. The typical characteristics of the old industrial area can be summed up as follows:

The large scale industrial bases were established in 19th century or earlier; the statistic number of population density in the region, central scale, and supply of industrial infrastructure are higher than the average level (compared with the suburbs and peripheral areas); it entered the industrialization stage early (compared with other areas in the same country); the leading industrial sector in the region is generally heavy chemical industry department, which is in the end of the industry chain and leads to economic structure single [6]; the economy in the region takes a small number of large scale state-owned enterprises, the product category of enterprise production is small, and the ranking system and concepts inside the enterprises are quite strong; the mobility in the region is low (including enterprises and employees); it is impossible to achieve economic revitalization only depending on its own efforts.

### 3. An empirical study of the old industrial zone in German Ruhr

#### 3.1 Regional characteristics of the old industrial area of Ruhr

The Ruhr area is one of the largest industrial areas in the world. It is located in the middle of North Rhine Westphalia (abbreviated as NRW), which is one of the five areas in the North Rhine Westphalia. It includes 11 counties, among which Tamonde, Essen, Bochum, Duisburg and so on are the comparatively famous industrial cities. The area of Ruhr is about 4,400 square kilometre, and the population is 5.5 million, accounting for 67% or so of Germany population after being unified [7]. The Ruhr area is not strictly administrative division, which is similar to the regional concepts of "South of Jiangsu" or "North of Jiangsu" in China. The natural resources in the region are rich, especially the coal, making the dominant industry in the area take steel and coal mining industry as the center. In addition, the Ruhr area also has the world's largest inland port, busy inland waterway, and the most dense railway network in Europe, with expressway leading in all directions. The geographic map of the old industrial zone in German Ruhr is shown in figure 1.



Figure 1. The geographic map of the old industrial zone in German Ruhr

The industrial development in German Ruhr has a long history nearly 150 years. Though in 14th century, people have begun to mine coal in Ruhr area, the coal mining industry is not quite important at that time comparatively speaking. Until 19th century, the growth of industrial revolution laid a fixed foundation for the prosperity and development of coal mining industry [8]. The coal mine developed in the canyon in Ruhr is suitable for coking, and it thus forms the basis of steel industry production and development. What's more, the process of industrialization of Ruhr also brought the rapid extension of the local transportation network, including roads, railways, and canals. Because of the radical Prussian policy, the industrial development of Ruhr after 1950s grew quickly, and people came to Ruhr for survival.

Between 1850-1925, the population of Ruhr area increased from 400 thousand to 3.8 million. In the first half of 19th century, the Ruhr area began large scale coal mining and steel production, and gradually became the most famous heavy industrial zone in the world. During the Second World War, the heavy industry and energy resource in Ruhr area play an essential role in the war in Germany. From 1943 to 1945, this area became the major bomb target of the allied forces. As a result, 75% of the areas are bombed, and more than 1/3 of the coals are destroyed [9]. After the war, this area was re-built rapidly, and it made great contributions to Germany "economic miracle".

#### 3.2 Decline of Ruhr's economy and traditional industry

From the end of 1950s to the beginning of 1960s, the cost for coal mining of Ruhr area was higher than that of America, China, and Australia. In addition, with the application of oil and nuclear power, the demand of the world for coal showed a decline trend. In 1957, Ruhr area had a total of 141 coals and

hired more than 500 thousand miners. From 1960s, the coal mining in the Ruhr area was decreasing year by year [10]. Due to the development of technologies, the number of personnel needed for steel, vehicles, shipbuilding industry was decreasing day by day. The steel production were transferred to sub companies except for the Europe, and the steel amount also shrank. As a result, from 1960s, the traditional coal industry and steel industry in Ruhr area began to decline. The factories of coal and steel were closed one by one. The employment of coal industry began to decrease from 1962, and decreased to 70 thousand in 1996 [11]. The steel industry lost 40 thousand operating posts, and the employment of shipbuilding industry decreased by 2/3. After 1970s, the decline trend of great industries was rather obvious, and it was more and more apparent after 1980s. To the end of 1980s, Ruhr area faced a serious unemployment problem. During the 40 years of 1961 to 2000, the employment rate of industrial departments in the Ruhr region decreased from 61.3% to 33.3%, as shown in table 1. From 1980 to 1994, the employment structure of Ruhr area also had great changes: the employment of agriculture and mining decreased by 33.3%, the employment in the industry decreased by 28.5%, the employment of construction business decreased by 29.8%, and only the employment of service industry increased by 19.6% [12]. However, the overall unemployment rate increased. In 1996, the unemployment rate of Germany was 10.3% and the unemployment rate of North Rhine Westphalia was 10.5%, while the unemployment rate of Ruhr was up to 15%-16%.

Table 1. The comparison of employment rate and unemployment rate between Ruhr area and Germany

	The primary industry		The secondary industry		The tertiary industry		Unemployment rate	
	Ruhr area	Germany	Ruhr area	Germany	Ruhr area	Germany	Ruhr area	Germany
1961	2.4	13.6	61.3	46.6	36.3	38.8	Unclear	0.5
1970	1.5	9.1	58.4	49.4	40.0	41.5	0.6	0.5
1980	1.4	5.3	51.7	45.3	47.0	49.4	5.3	3.5
1990	1.2	3.6	44.4	40.6	54.4	55.8	10.8	6.6
2000	1.2	2.5	33.3	33.5	65.4	64.0	12.2	8.1

#### 4. Inspiration of German Ruhr to the old industrial areas in northeast China

From the theoretical analysis and the combined application of the empirical case analysis, we draw the following conclusions:

First of all, for a gradually developing country and region, the change of economic structure is an eternal economic topic. The old industrial area is a region that has gone through a long period of economic prosperity. However, the long time economic prosperity and the resulting output growth have destroyed the economic survival environment successful product under certain conditions. If the "sunset products" in the traditional industry are unable or unwilling to leave the area, this will make the situation in the old industrial zone worse [13]. Because the existence of this product is bound to the resources that should be used for the development of new products and new industries. In a sense, the unitary nature of the industrial structure in the old industrial zone is not the cause of the economic decline, but the result of this kind of behavior.

Secondly, the makers of old industrial areas, including politicians, managers and trade unions, do not act on their own in the period of economic decline, but react to the further integration and centralization of regional economy. Usually this reaction is mainly due to the unity of fear caused by the behavior, which encourages the generation of "Rent-seeking" behavior. Nowadays, most countries and regions are experiencing the process of economic restructuring in varying degrees. In particular, many countries in Western Europe and the traditional old industrial areas in northeast China need economic adjustment and restructuring. Although Ruhr transformation is a specific example, the process of structure transition may provide some enlightenment on how to resist the region's industrial decline for the transformation of the countries and regions. Firstly, the case of Ruhr reveals that the reorganization of regional economic structure is a long process. This process may be completed not in a few year, but it took decades. It sounds a bit discouraging but it's true and can't be ignored. In dealing with regional

structural adjustment problems, it is almost impossible for people to resort to "quick fix", because "the choices made by people in the past determines its now possible choice" [14]. It is impossible to change the historical development path of a country or region in the short term. Secondly, the inspiration from the ups and downs of Ruhr's structural adjustment process is, from an ideal point of view, that the revival strategy of national or regional economy should be separated from the existing economic system structure of the problem area. In general, we believe that the "new industry" policy based on Ruhr assets is more reasonable than the "re-industrialization" policy, which is simple and unfounded [15].

Thirdly, if the old industrial zone can get out of the predicament of economic decline, most of the industries that help them get out of the predicament are related industrial diversification in the area. The policy orientation of diversified economic structure can undoubtedly help to break the single structure of regional industry. And at the same time, it can also improve various absorptive and adaptive abilities that will help to achieve new economic development.

Finally, the case of Ruhr transformation shows us that it is very important to have a group of adventurers who dare to try and support structural transformation strategies in the region. Unlike the top-down policy starting from the outside, the bottom-up strategy from the inside can give full play to the local creative potential. Even in the traditional old industrial area, which is locked in the historical development path, such as Germany and Ruhr in the age, this way is also effective for getting out of the economic haze.

## 5. Conclusion

We can bring these successful experiences of Ruhr into full play, with these experiences as supplementary materials, so as to modulate the best solution that can solve the economic decline of the old industrial area. However, when we use these successful experiences, we should also pay attention to that the case of successful transformation in Ruhr is important, but it is just the "time and space specific environment" in the economic life chain. That is to say, when the different old industrial countries or regions are in the process of economic revitalization, the decision to adopt which strategy should be carefully considered. Because different countries or regions have different regional characteristics and diverse external environment, the strategy adopted should be suitable for the local area, and can be accepted by the local area and compatible with the local area. However, the experience of Ruhr in Germany is still useful. In fact, the inner essence and speed of structural change of every old industrial area depends not only on specific time and space, but also on the responses of local communities to policies. It is based on this view that we believe that the old industrial countries or regions, including the old industrial base of northeast China, can still be inspired from the experience of Ruhr, and finally go out of the low economic downturn and achieve the goal of revitalization.

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