

Research on the Impact Mechanism of High-speed Train on Regional Economy under the Background of Sustainable Development

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Abstract: With the improvement of high-speed train economy, the safe transportation capacity and speed of China's high-speed train have been improved. The arrival of the high-speed train era is the rebirth of the railway hub economic zone, which will bring unprecedented impact and innovation. High-speed train economy can highlight regional geographical advantages, establish regional economic network, optimize regional industrial structure, and finally promote the development of regional economy and even the whole social economy. It can be seen that the importance of high-speed train economy to regional economic development deserves attention and attention. Based on the national conditions and road conditions, this paper summarizes the regional mechanism and economic and social effects of high-speed train economy. This paper discusses the urgency and feasibility of speeding up the construction of high-speed train to promote the sustainable development of regional economy with the reform and opening up entering a new stage, the development of socialist market economy, the further acceleration of people's life rhythm and the improvement of railway construction environment. Based on this, this paper puts forward some thoughts and suggestions on the development of high-speed train economy in the new era, which is helpful to comprehensively evaluate the impact of high-speed train on regional economy. In the future, we should continue to improve the layout of high-speed train network, further promote regional economic integration, and accelerate the optimization of economic spatial pattern under the high-speed train network.

Keywords: Sustainable development, High-speed train, Regional economies.

1. Introduction

Transportation is a special material sector for the survival and development of human society [1]. Economic development, social needs and scientific and technological progress have promoted the development of transportation, and its development has laid a solid foundation for the economic development of all countries in the world. As an integral part of China's transportation system, high-speed train is as small as every citizen's mode of travel [2]. After the implementation of high-speed train transportation, it not only shortens the time and space distance of people flow and logistics information, but also promotes the economic and cultural exchanges in different regions, which has played an irreplaceable role in promoting the development of social economy, politics and culture. With the improvement of China's high-speed train network layout, the high-speed train with the characteristics of high speed and large traffic volume has significantly improved the level of connectivity between cities, expanded the area that passengers can reach per unit time, and thus expanded the scope of economic activities [3]. Therefore, the improvement of the high-speed train network can have an important impact on expanding the market scope and enhancing the economic flow. Judging from the role of high-speed train in regional economy, high-speed train will undoubtedly become the real locomotive of China's regional economic development in the future, pushing China's regional economic development to a new historical stage. Based on this, the research on the impact mechanism of high-speed train on regional economy under the background of sustainable development has become a hot issue.

It is the concentrated reflection of the high-tech of high-speed train on the railway, which has brought about new and

significant changes in the transportation structure, and is the inevitable outcome of the development of contemporary economy, society, science and technology and transportation [4]. High-speed train economy can accelerate the evolution of regional economic spatial pattern, speed up regional economic development, optimize regional industrial structure, increase regional economic aggregate and promote the construction of regional transportation network, so that high-speed train transportation, regional economy and social economy can achieve common development [5]. The construction and operation of high-speed train will greatly promote the economic and social development of local and surrounding areas, and also play a positive role in strengthening regional economic cooperation and promoting sustainable development. It accelerates the flow of people and things between regions, is conducive to optimizing resource allocation, maximizing personal and social benefits, and ultimately promoting economic and social development and progress [6]. How to maintain the sustainable competitive advantage of high-speed train in the transportation market and coordinate its development with other modes of transportation is an important issue concerned by current theoretical circles and railway departments, and also a key issue affecting the sustainable development of high-speed train. Based on this, this paper discusses the influence mechanism of high-speed train on regional economy under the background of sustainable development.

2. High-speed Train Development Under the Background of Sustainable Development

With the development of industry, the consumption of energy is increasing day by day, and the limited status of the earth's resources makes it imperative to vigorously promote sustainable development [7]. The emergence and development of transportation is the basic element of the emergence and development of regional economy. At the same time, "traffic" has always been the premise and foundation to promote social and economic development. At present, transportation is a major consumer of natural energy, especially fuel oil, while high-speed train and rail transit mainly use electricity as energy, and hydropower and nuclear power can be selected in the choice of electricity. After comprehensive evaluation, it can be considered as a transportation mode that conforms to the low-carbon economy strategy. In the study of the impact of high-speed train on regional economic development, high-speed train plays an obvious role in industrial layout, labor productivity market development, commodity circulation, natural resource development, environmental protection and sustainable development. At present, the technology of high-speed train is developing continuously, which has good economic and social benefits, and is a resource-saving mode of transportation for sustainable development. The construction of high-speed train will help China to establish a resource-saving transportation system as soon as possible, and will have a key impact on the strategy of sustainable development. Table 1 shows the degree of environmental pollution caused by several modes of transportation.

Table 1. The degree of environmental pollution caused by several modes of transportation

Emission material	automobile	plane	high-speed train
CO	1.25	0.50	0.003
NOX	0.25	0.71	0.12
CO ₂	110	159	28
SO ₂	0.03	0.05	0.01

From the macro level, the direct role of the development of high-speed train is to promote economic development and promote the smooth implementation of national strategic transformation; Making regional linkage and forming a unified domestic market is the real implementation of the scientific development concept, comprehensive, coordinated and sustainable development. The source of sustainable competitive advantage of high-speed train is the heterogeneity of transport products provided by high-speed

train transport enterprises compared with other transport modes. The connotation is reflected in two aspects: First, the high-speed train has the ability to surpass or surpass competitors in terms of the value it can create for customers. Second, this advantage is more reflected in sustainability, that is, whether these competitive advantages can guarantee the potential of high-speed train to create value for customers for a long time in the future development. The construction of high-speed train in the main transport corridor will greatly improve the effective supply of railway transport capacity and create favorable conditions for the coordinated and sustainable development of regional economy [8]. Relevant departments should rationally plan and develop high-speed train by combining with national strategies. Adhere to the advantages of post-development and establish sustainable high-speed train; Establish an environmentally-friendly and economical high-speed train; Establish advanced high-speed train, etc.

3. Influence Mechanism on Regional Economy of High-speed Train

3.1. Promote the Continuous Optimization of Regional Industrial Structure and Accelerate Economic Development

China has a vast territory and a long transportation distance. Improving the driving speed is of great practical significance to shorten the transit time, speed up reproduction and improve people's living standards [9]. "Traffic function" has always been the core function in urban construction and development. Compared with other railway transportation modes, high-speed train has distinct characteristics and advantages: (1) It runs fast. (2) Higher safety and comfort. (3) Lower energy consumption and more environmental protection. (4) The unit transportation capacity is lower than that of highway and aviation, but the transportation capacity is larger than that of aviation and expressway, and the comprehensive cost is significantly lower than that of expressway. In order to meet the needs of high-speed train economic development, the urban areas where high-speed train goes will constantly change the urban industrial layout, so as to continuously optimize the industrial layout, improve the urban industrial system and urban hierarchy, and finally promote the economic development of urban areas. Specifically, the high-speed train has improved the regional transportation conditions, solved the problems of insufficient linkage with the surrounding areas and transportation shortage, created conditions for complementary advantageous resources among different regions, realized the effective utilization of resources, and improved economic benefits. Figure 1 shows the mechanism of high-speed train on industrial structure.

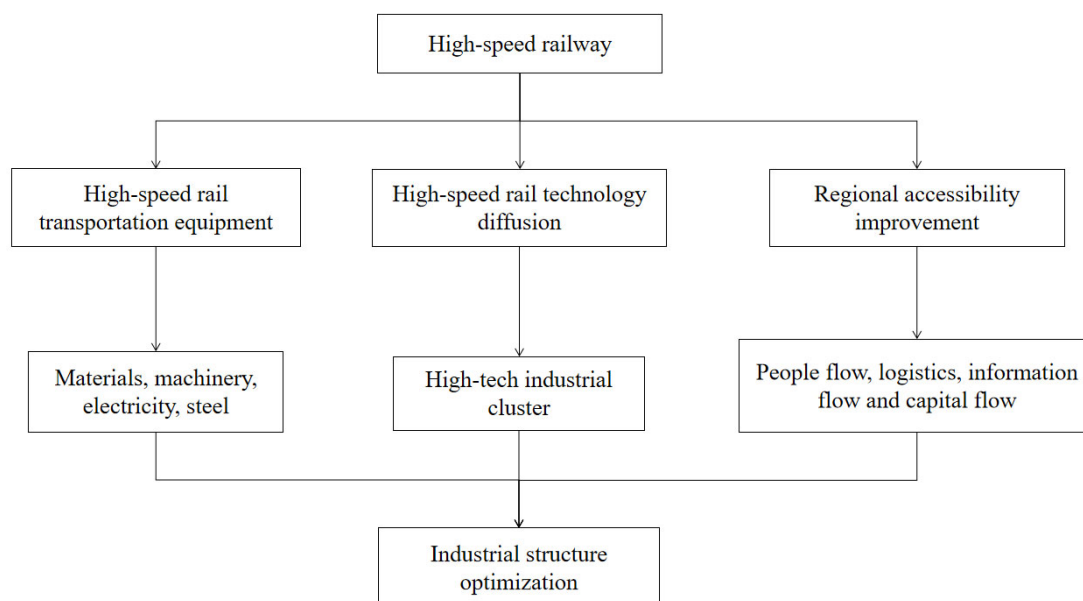


Figure 1. Mechanism diagram of high-speed train's effect on industrial structure

With the continuous improvement of the high-speed train network, the "dividends" of the high-speed train economy are further released, and radiation and linkage effects occur in adjacent areas or in a larger scope; Accelerate the process of urbanization, promote the economic growth in the hinterland, and promote the development of regional economic integration in a wider scope and at a higher level. The operation of high-speed train can improve the environment of urban and regional economic development and investment, strengthen the regional advantages along the line, improve the accessibility and location conditions of the areas along the line, and have an important impact on regional economic spatial pattern and regional economic development. At the same time, under the influence of the high-speed train economy, many industries will constantly innovate their own production methods and change their business philosophy to promote the coordinated development of industry and high-speed train economy. Therefore, under the influence of the high-speed train economy, the industrial structure gradually changes, which is the best opportunity for the transformation and upgrading of traditional industries, and also an effective way to improve the speed of regional economic development. In addition, the high-speed train itself is the product of high-tech development, involving a series of high-tech fields such as electronics, information, materials, aviation, environmental protection, etc. The construction of high-speed train can not only improve the knowledge intensity in the railway system, but also drive the development of a large number of related high-tech industries, and promote the development of China's industries in a high, sophisticated and sophisticated direction.

3.2. Promote the Construction of Regional Transportation Network and Increase Employment Opportunities

Vigorously developing rail transit is the first way to solve urban traffic problems. Cities with a population of more than 10,000 all over the world have generally realized or are planning to implement a three-dimensional rail transit network consisting of subway, light rail, suburban railway and trunk railway. Urban traffic and intercity traffic are

effectively integrated in this way, which is the objective requirement of urbanization [10]. High-speed train itself is a means of transportation and an important part of the transportation system. The development of high-speed train economy can gradually improve the high-speed train transportation system, thus promoting the construction of regional transportation network.

With the support of high-speed train economy, high-speed train has been effectively connected with roads, aviation and other transportation, which not only speeds up the construction of high-speed train and improves operational efficiency, but also helps to improve the transportation network and facilitate people's travel. The more developed the network, the easier it is for elements to flow to the growth pole, and the easier it is to form the growth pole; Once the growth pole is formed, the diffusion effect on the surrounding areas will be more obvious. At the same time, from the perspective of environmental protection and resource conservation, railway is a transportation mode with relatively low transportation consumption and low transportation cost. The construction of high-speed train can optimize the transportation structure and save the total social transportation cost. In addition, after the construction of high-speed train, tourist attractions in many areas have been vigorously developed and industrial industries have gradually transformed, which means that the economic growth mode of these areas has been optimized.

4. Conclusions

It is a product of the high-speed train era, which is necessary and qualified in China. With the continuous improvement of China's high-speed train transportation system, it has gradually formed a perfect subway economic system. The construction of high-speed train is an important strategic measure for the revitalization and development of China's railway transportation, and it will be the backbone of the passenger transportation network in the whole transportation system in the future. From the perspective of high-speed train's own development, high-speed train has driven industrial upgrading. In addition, as a high-tech high-

speed train, its own development has also promoted the development of related industrial chains and advanced technologies. The linkage development of high-speed train hub and regional economy is the key link to promote the upgrading and development of high-speed train economy. The development of high-speed train economy needs to pay attention to the radiation effect and linkage effect of high-speed train hub economy, and promote the transformation from "traffic circle" to "economic circle". Accelerating the development of high-speed train is of great significance to China's economic development and scientific and technological progress. According to the conclusion of the impact of high-speed train on regional economy, the future development plan of China's high-speed train should gradually extend to the western and northeast regions, and improve the high-speed train network in economically underdeveloped regions, so as to achieve further coordinated development of regional economy. However, although the high-speed train economy has created many development opportunities and played an irreplaceable role in promoting regional economic development, the actual regional economic development still faces many challenges and dilemmas brought by the high-speed train economy. If we can't improve our ability to cope with various challenges and difficulties in time, we will lose many development opportunities. Therefore, the high-speed train economy is a double-edged sword. We need to grasp the opportunities brought by the high-speed train economy in combination with the reality, and then formulate a regional economic development strategy in line with the reality.

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