

Analysis of economic risk factors avoidance in urban rail transit

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Abstract. Since the new century, the development scale and population inflow of China's cities have been accelerating, and the corresponding car ownership has also risen, making the problem of urban traffic congestion more prominent. Due to its special underground operation mode, rail transit not only relieves the pressure of urban surface traffic, but also makes an outstanding contribution to promote ecological protection. However, from the actual situation of rail transit operation and development, the economic risks are widespread and limit the construction of urban rail transit. The economic risks are widespread and limit the construction of urban rail transportation. Based on the connotation and characteristics of rail transportation, the article analyzes the economic risk factors in urban rail transportation from the aspects of demand, operation and finance, and explores how to avoid the economic risk of urban rail transportation operation.

Keywords. Urban rail; transportation development; economy risk; influence factors; avoidance countermeasures.

Urban rail transit is now an internationally recognized green transportation with low energy consumption and high capacity, which is fast, efficient and less polluting, and can ease the pressure of urban traffic. At present, China's urban rail transit construction is in the golden period of rapid development. In recent years, the scale of urban rail transit operation, passenger volume, length of lines under construction and length of planned lines in China have all reached record highs. The development of urban rail transit is becoming more and more networked and differentiated, with diversified system structure and network operation gradually realized. By the end of 2019, 40 cities in mainland China have opened urban rail lines, with a total operating line mileage of 6,736.2 km. From the perspective of modern urban rail transit planning and design, economic factors are important factors affecting the development of rail transit construction. In order to better promote the development of urban rail transit construction, the article combines the actual situation of urban rail transit construction development in Zhejiang and explores how to better optimize urban rail transit construction.

1. Overview of the basic development of urban rail transit

Urban rail transit is a vehicle transportation system that uses rail structure for load-bearing and guiding. Urban rail transit is the backbone of urban public transportation and is widely used in the construction of large and medium-sized cities. As an internationally recognized green transportation, rail transit has the unique advantages of economy, environmental protection and high efficiency. It has a positive effect on improving the transportation capacity and travel efficiency of the public. China's rail transportation is mainly metro transportation, and the rail transportation network in developed countries already covers a wide area, and the threshold of rail transportation population is also low, so the total rail transportation mileage is long.

Along with the accelerated urbanization process, the number of urban motor vehicles is rising. Traffic and transportation, urban production layout defects contradictions are increasingly prominent. Traffic congestion seriously restricts urban development. The emergence of traffic congestion makes the space for human living and activities compressed, which eventually not only affects the quality of life of the general public, but also restricts urban development. From the perspective of actual operation and development, urban rail transit has the characteristics of large area, large transportation capacity and high efficiency. In the context of increasing population, urban rail transit has become the primary choice for people's daily travel. Urban rail transit construction can not only reduce the emission of motor vehicle emissions and improve the environment that people depend on, but also drive the development of related industries, such as infrastructure construction and intelligent equipment development. Based on the importance of urban rail transit construction, it is necessary to analyze the economic factors affecting urban rail transit construction and propose corresponding countermeasures according to the influencing factors.

2. Analysis of urban rail transit operation characteristics

First, large investment scale. Compared with general urban infrastructure, urban rail transit construction has the feature of large scale. Secondly, it does not occupy the surface road. Surface traffic in large cities is basically in a saturated or oversaturated state, and the development of public transportation underground is a necessity. Thirdly, fast driving speed and high capacity. Compared with ground transportation, rail transit (subway or special line light rail) are no traffic lights, intersections, in addition to stopping is driving, there is no other vehicle interference, driving speed is relatively fast, high efficiency. Fourth, the environment is comfortable. People ride the subway, not affected by the season and weather. In addition, rail transit is more stable than buses when running. Fifth, less economically profitable. The economic profitability of urban rail transit is influenced by the sunk cost of urban rail transit. From the connotation point of view, the sunk cost of urban rail transit mainly refers to the fact that the project input cannot meet the development needs of the whole project during the planning and construction stage. The purpose of urban rail transit construction is to realize the modernization of the city, to relieve the internal traffic pressure from the perspective of urban development and construction, and to provide important convenient support for people's travel. However, from the current development

situation, the economic construction level of urban rail transit is low and the economic profitability cannot be fully displayed.

3. Economic attributes of urban rail transit development

Urban rail transit is an important urban infrastructure and belongs to a public product. Urban rail transportation service has the characteristics of non-competitive consumption and certain exclusivity, that is, the transportation construction and development of urban rail transportation has the attributes of a public product. It can provide services for social development and has the economic attributes of a quasi-public good.

(1) Capital-intensive and sunk cost

Compared with general industrial and commercial enterprises, urban public transportation construction and development requires a large amount of investment and is a capital-intensive enterprise. From the perspective of actual development, most public transportation investments have the characteristics of sunk capital. In particular, rail transportation has a strong sunk cost property. Once the investment is made, it is impossible to withdraw the invested capital, regardless of whether the development is in a desirable or undesirable state.

(2) Externality

Externality mainly refers to the fact that the construction and development of urban rail transit is deeply influenced by the external environment. With the development of social economy, the division of labor in various fields is becoming more and more clear, and the development of urban rail transit is deeply influenced by social economy. Any micro-level changes will affect the overall development of urban rail transit. The externalities of urban rail transit development are reflected in three aspects: first, the externalities between producers, such as the policies of land developers along the metro line profoundly affect the development of the metro. Secondly, the externality between producers and consumers. Subway rail transportation drives the development of surrounding businesses along the line and provides important convenience support for people's daily life. Third, the consumer-to-consumer externality.

From the actual situation of urban metro rail transportation development, the construction and development of urban rail transportation will drive the development of surrounding real estate and business. At the same time, it will also provide important convenience support to people's daily life and facilitate their travel. This externality of urban rail transit is reflected in the impact of the development of metro rail transit on urban progress, which exceeds the economic benefits gained from metro rail transit and, at the same time, reduces the profitability of metro rail transit.

(3) Natural monopoly

The formation of economies of scale is a sufficient condition for natural monopoly. The formation and development of economies of scale will inevitably produce monopoly, but monopoly will not necessarily produce economies of scale. The economy of metro rail transportation is shown as follows: Firstly, rail transit is based on the construction of road network, which covers a wide area and has a relatively high development efficiency. Secondly, the construction scale of rail transit network is huge, the construction period is long, and the construction funds are consumed, which will generate a relatively large capital flow. Third, the use of rail transportation assets and equipment is relatively long, and the utilization of funds reflects permanent characteristics. Fourth, the level of service application provided by rail transit at any service point and time period is deeply affected by the overall level of the entire metro rail transit. Fifth, metro rail transportation can be basically subdivided into traffic in the road network section and auxiliary transportation management traffic. These attributes in urban rail transit profoundly affect the construction and development of the entire urban rail transit.

4. The economic risks faced in the process of urban rail transit operation

(1) Risk on market demand

At present, China's socialist market economy is becoming more and more perfect, and urban rail transportation has reflected excellent attributes. The government department provides financial support for the development of urban rail transit construction and provides sufficient support for the development, construction and management of the project. From the perspective of rail transportation operation development, if the total supply in the market exceeds the demand, then the capital investment in rail transportation will also be reduced and investors will gain benefits from the project operation and management. In addition, if the public demand for rail transit services decreases during the concession period, eventually the project's facilities will not be developed to meet the expected traffic volume needs, thereby reducing the overall project operating capital flow.

(2) Competition

Considering the competition with public transportation development, the fare setting of rail transit should take into full consideration the cost performance. From the actual situation of development, the results of competition between rail

transit and road traffic will be directly related to the share of rail transit in the transportation market and the actual number of passengers completed. For this reason, rail transit fares need to be kept in a reasonable proportional range with other transportation fares, and to enhance the market competitiveness of rail transit through the reasonable formulation of prices. And to attract more passenger traffic support for the construction and development of rail transit, so as to realize the unity of economic and social benefits of rail transit.

(3) Operational risk

Considering the competitive relationship between rail transportation and other public transportation, rail transportation fares should be set to give full play to the advantages of cost performance. At the same time, from the actual situation of operation development, the financial income of rail transportation projects reflects the obvious uncertainty. In the project operation and management, we should focus on taking active measures to prevent rail transit operating cost overruns, lower revenue than expected targets, and low operational efficiency.

(4) Financial risk

The size of financial risk of urban rail transit operation is closely related to the ability of the indebted subject to repay debts. From the actual situation of development, the financial risk of urban metro rail transit operation is specifically divided into the financial risk of adaptation to major economic events, the financial risk of price fluctuation, the financial risk arising from interest rate and exchange rate changes, etc. After the appearance of financial risk the capital income of urban metro rail transit cannot pay the debt and interest, the indebted enterprise will be sued by creditors and bankruptcy will occur.

5. Example analysis of economic risk impact of urban rail transit in Zhejiang

(1) Basic situation overview of urban rail transit in Zhejiang

Zhejiang Urban Rail Transit Company is a public-private partnership company, which is a franchised train and electromechanical equipment investment and construction, and is a domestic PPP operation mode metro project. The whole metro rail transit investment and construction task is divided into two parts; the overall investment of part A occupies 70% of the overall investment and the overall consumption cost is 10.7 billion RMB, including land acquisition and demolition, engineering construction, rail engineering and human defense engineering. The infrastructure construction company is responsible for the investment and construction of the metro railroad. After the completion of the construction, the assets and rights of use of the project are provided to PP in the form of capital contribution or lease. The part of assets financed according to the right of use is called A1, and the part of leased assets is called A2. The second part accounts for 30% of the overall investment, with total assets of 5 billion RMB, including vehicles, automatic ticketing system, signaling and communication, air conditioning and ventilation, water supply and drainage and firefighting, automatic elevators, and power supply facilities and equipment.

(2) Economic risks affecting the entire rail transit construction

First, the project investment amount and operating costs. The cost of the whole project construction includes the investment amount of the project and the project operation cost. The investment amount includes the engineering cost, vehicle elevator equipment purchase cost, installation project cost, basic preparation cost, and the amount of paving liquidity invested in the early operation period. The operating cost is the outflow of funds generated during the operation of the subway project, including labor costs, maintenance costs, management costs, etc. Second, fare and passenger flow. Fares are an important source of revenue for the whole project, and the subway project is a project for the benefit of the people. Therefore, the fares set by the whole project in the process of construction and development should be reasonable. At the same time, the formulation of fares also needs to ensure that investors can get a return on their investment. Third, government subsidies. As the main force of investment and operation, enterprises need to bear certain responsibilities in the process of operation and development. In the process of development through certain means to compensate for the difference between costs and revenues, so that the development of enterprises to generate a reasonable profit.

(3) Countermeasures to avoid economic risks of urban rail transit

First, properly handle the balance between development speed and development efficiency. Provide necessary financial support for the management of rail transit under the support and guidance of government departments to make up for the problem of shortage of urban rail transit fund development. To regulate the construction of urban rail transit, it is necessary to fully consider the economic benefits and development efficiency, and promote the diversified development of financing through the introduction of competition mechanism. Second, give full play to the functions of government departments in the construction of rail projects. In the process of urban rail transit construction planning government departments need to fully understand their important role in the project planning. Play their own influence to better regulate and organize the development of metro rail transit, and reasonably regulate the price of urban rail transit services. Thirdly, we should mobilize the advantages of the internal transportation network of the city. Urban rail transit planning should consider the relationship between the production cost of each business upstream and downstream of urban rail transit and the total cost of integrated production enterprises, and take the role of urban rail transit and road network planning as an important

basis for construction. By supplementing the network nodes and creating new connections, new transportation products are added to provide more convenient services to passengers. In the future, urban rail transit planning and design should be connected with public transportation and civil aviation transportation planning to create a three-dimensional and convenient transportation network. Fourth, to achieve the innovative development of urban rail transportation management technology and improve the rail transportation management system. Urban rail transit construction can be improved through advanced technology and management forms to improve the urban rail transit management system, with the help of advanced technology forms to improve the response speed and efficiency of urban rail transit. The planning and construction of urban rail transit relying on advanced technology can be divided into three stages: First, the initial stage. The initial stage requires the construction of a complete rail transit infrastructure line that runs from east to west, north to south. Second is the rapid development stage. In this stage, it is necessary to create a perfect scale of urban rail transit network. Third is the mature stage. In the mature stage, the advanced technology is used to improve the urban rail transportation management system, so as to optimize the urban rail transportation network.

6. Conclusion

In summary, the introduction of modern investment and management mode into the planning and management of urban infrastructure can provide dynamic support for urban development. Urban rail transit construction is an important component of urbanization construction, and the relationship between the speed of rail transit construction and construction efficiency should be properly handled. We should give full play to the function of government departments, and cooperate with many parties to better promote the development of urban rail transit construction.

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