

The Research of Urban Traffic Network Influence on Urban Agglomeration

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Abstract: With the analysis urban traffic policy and illustration of the concept of accessibility of transportation network, we found that urban transport policy and the accessibility of transportation have become important factors which affect residents' employment and living, the enterprise's location. This article also demonstrates that the "Matthew effect" does exist in the urban traffic and urban agglomeration, which will lead to greater urban agglomeration.

Introduction

The development of urban transport promotes urban economic development, and causes urban agglomeration. Since the reform and opening up, Chinese metropolitan cities experienced explosive population growth and geographical expansion. However, a series of urban phenomena and problems occurred during the Chinese city agglomerating.

1 Current Situation of Traffic Congestion

The process of urbanization is speeding up and urban transportation network is improving. From the year of 2006 to 2015, the average built-up area of city has increased 53.04%. As the city's most important facilities, urban transport infrastructure is increasing its investment and construction. By the end of 2015, China's total railway operating mileage has reached 121,000 km and highway mileage reached 19,000 Km. Moreover, the government plans to investment 610 billion Yuan for transportation infrastructure during the "Thirteen Five" to enable high-speed railway operating mileage to reach to the 30,000 km, which can coverage 80% of the metropolitan. High coverage transport networks attract a large population of people and numerous enterprises to gather here.

The income gap is widening between cities and population is migrating to large cities. Urban economic development is associated with high income and high rate of employment. According to the government's statistics, the average wage in Beijing, Shanghai, Shenzhen and Guangzhou is more than 8,000 Yuan, which is far exceeding the second and third rank cities. The continuous increased population requires the accelerated construction of urban traffic network. The accessibility and high wage attract a large population continually migrating to large cities. The total population of Beijing, Shanghai, Shenzhen and Guangzhou are over 10 million in 2015, and migrant workers are more than 50% and most of whom are young people. This phenomenon that the elderly and children left in rural areas is widespread. Wage gaps between big cities and small cities are considered to be the most important factors leading to metropolitan agglomeration.

Urban transport resources are overused and negative externalities are increasing. A large number of population in urban will inevitably lead to a huge demand on urban resources, like the transport infrastructure. Urban transportation resources as kinds of public goods should be a possession shared by everyone. Whereas, the excessive use causes negative impact, such as the reduction in the travel efficiency and quality of residents, as traffic congestion, environmental pollution.

Government adjusts the allocation of resources by policies, which cannot make up for the serious imbalance between supply and demand. In order to lower the negative externalities form population agglomeration, the government introduces a series of policies, such as the congestion charge, vehicles

allocation by a license-plate lottery system, license number restriction on vehicles' road driving, charging stations to use of new energy vehicles and strictly settling policy for population, etc.. Government policies bring certain effects, but the extent of urban agglomeration is still expanding, and transport negative externalities still exist and cannot be ignored.

2 Traditional Agglomeration Theory and Its Limitations

The study from the urban location extended to urban agglomeration has been done by many economists. Urban agglomeration includes population concentration, urban industrial agglomeration and urban agglomeration economies, three of which are mutually reinforcing. The transportation cost is considered to be the most important factor on city's industry location and the leading cause of urban agglomeration. Urban development is a continuous coordination process between spatial and time, until it reaches a dynamic equilibrium. Therefore, with the improvement of transport infrastructure and transport technology, the city spatial layouts are constantly adjusted to adapt urban transport, so that the allocation of resources towards more effective direction.

Classic agglomeration theory analyzes the impact of urban transport development on urban agglomeration mainly from three aspects. For instance, agglomeration can produce share of labor, intermediate products, and technical spillovers, which are the main reasons leading to agglomeration by Marshall (1890). Krugman (1991) believed that the increasing returns to scale and transport costs are also contributed to the urban agglomeration, which cannot be ignored. With the criticism, absorption and development made on urban economics, urban geography, traffic location, the subsequent scholars believed that the urban traffic network externalities are also considered to be the affecting factors through the government policy, accessibility and reliability of transport networks, transport networks "Matthew Effect". In the past, institutional factor was not taken into account, whereas the government policies played a very important role in urban agglomerating, such as generous benefits attracting immigration but strict household registration system and the lottery system increasing the access threshold. In the Classic agglomeration theory, transport costs and transit time are two key factors to urban agglomeration, while Convenience and accessibility also contribute to urban agglomeration, because residents not only concern about whether to reach the destination, but also about the efficiency and punctuality. Moreover, the convergence and structure of urban transport system have a direct effect on agglomeration. Thus, a serious imbalance traffic situation emerges in different cities leading to the strong stronger and the weak weaker, which called "Matthew effect". The well-developed transport network causes a serious population gathering, leading to greater demand for urban transport, and the city will invest more funds for the construction of the transport network, which will attract more people in cycles.

3 Analysis of externalities metropolitan transport network of urban agglomeration

With the development of the theory of agglomeration and serious agglomeration of metropolitan cities, urban agglomeration economies become a vital topic of economic research. This paper illustrates the policy effect of transportation, transportation accessibility effects, transportation network "Matthew".

3.1 Effect of urban transport policy on urban agglomeration. Transport policies are considered to be the key factors leading to industrial and population gathering. On the one hand, the government continues to invest in transport infrastructure, which brings the agglomeration of time-demanding industries, such as delivery industry, fresh fruit and vegetable industry, tourism. The implementation of government subsidies for urban public transport also promotes the population gathering. Taking Beijing as an example. During the year of 2007 to 2014, the Beijing subway adopted the "two Yuan" single fare system. Preferential transport fares, differentiated mode of transportation, high-quality

transportation service not only improve the quality of the residents' life, but also reduce commuting costs and attract a large number of North Drift people. On the other hand, as the population gathering and industry concentration, urban resources are consumed excessively and the city's negative externalities have become evident increasingly. So the government introduces transport policy to curb negative impact of traffic, thus, lots of policies have been implemented in Beijing to alleviate congestion and environmental pollution. The implementation of transport policies improve the urban environment while increase the transportation costs of heavily freight-relying enterprises and then lead to such companies shift outward.

3.2 Mode of action of urban transport systems to urban agglomeration. Urban traffic network's improvement means the improvement of urban accessibility, the compactness of urban traffic matching degree and the increase of transport nodes. Firstly, the accessibility of city traffic can reduce the time costs of enterprises and residents. The improvement of the transportation system expands the scope of searching for resources; enterprises can not only obtain more cheap raw materials and labor, but also shorten the search time and improve the timeliness. For residents, urban spatial accessibility shortens the travel time and relative distance, people can travel more conveniently and quickly. Secondly, the compactness of urban traffic matching degree is beneficial for enterprises' economies of scale. Enterprises along the city traffic line reduce inventory costs and transportation costs and realize the economies of scale easily, together with the benefits of time compression and better cooperation with other enterprises. Thirdly, the increased urban traffic nodes highlight the convenience, safety, big capacity and low cost of the urban traffic network capacity, which can meet the requirements of the enterprises' transport supply and demand of large volumes, hence an attraction to industries. Urban traffic node cluster realizes the flexibility of production, bringing industrial agglomeration and concentration in employment as well.

Urban Traffic Network also leads to the proliferation of enterprises and residents. The expand coverage of urban traffic network improves the accessibility of urban space. Both the enterprises and residents tend to resident in high accessibility areas, whereas the land supply inelasticity causes the area rent rise along traffic lines. Therefore, businesses and residents need to balance high rents and transport costs, which lead to urban expansion periphery.

3.3 Urban Traffic and agglomeration forming a "Matthew Effect". Urban transport and urban agglomeration form a clear "Matthew Effect". First, the urban transport promotes agglomeration, and the higher the degree of concentration has the greater the demand for traffic, then urban transport increases efficiency and the capital returns, more funds will be invested in urban transportation infrastructure construction. The improved urban transportation network can increase the accessibility of urban space, which will promote the city's economic development, therefore lead to more business and population agglomeration. Transport itself has economy scales, while transportation infrastructure has the characteristics of strong dedicated sets, large input costs, and the economies of scale is significant. Therefore, the multiplier effect promotes the city's transport system and urban agglomeration. The more developed transport network, the greater mobility of production material and the more conducive to generate growth axis or growth belt. Those areas help the built of region's leading enterprises and attract other small businesses.

4 Conclusion

With the analysis of transport policy in Beijing and the impact of traffic accessibility of urban agglomeration, this paper comes to a conclusion suitable for the current situation of China's urban development, but different from the classical agglomeration theory. The real situation can not be demonstrated just from the perspective of transport costs. A combination of time cost, comfort, reliability is much appropriate for people's residence and enterprises' location, which makes a better explanation of the transport network urban agglomeration mechanism. First of all, policy guidance

plays a significant role in agglomeration and can optimize the allocation of resources in urban traffic with the account of the configuration of transport resources from the time and space perspectives. Moreover, the transportation accessibility and reliability shall be improved to meet the requirements of residents and businesses. Finally, transportation resources between cities should have some balance when taking the economic situation and the “Matthew effect” into account. By means of coordinating the relationship between urban space through industrial area and living area, the society can promote the healthy development of urban agglomeration.

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