

Analyze China High-Speed Railway Ticket for Spring Transportation from the Perspective of Microeconomics

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Abstract: In recent ten years, the rapid development of China high-speed railway is called "China miracle", and it not only provides great convenience for people's daily life trip, but also greatly promotes the economic development. However, the annual spring transportation in the special period is still a great challenge to high-speed railway transportation, and this paper analyzes the high-speed railway ticket for spring transportation from the perspective of microeconomics, and then thinks for the solution.

This paper specifically analyzes the problem that demand exceeds supply for high-speed railway ticket by using the theories of the demand elasticity of supply and demand and the influence of price on supply and demand, monopoly markets. In addition, opportunity cost, incomplete information and other economic principles are used to think about the theoretical reasons for the difficulty of buying tickets during the spring transportation. I have given my understanding for the two problems owned by China spring transportation, and the corresponding countermeasures and suggestions. For example, speed up the development of substitutes and carry out the mechanism of price fluctuation; In the ticket refunding mechanism, this paper boldly conceives the method to relieve the pressure through a reasonable and scientific ticket refunding mechanism. Finally, this paper starts from the source and find the key point to solve the problem of spring transportation in China by breaking the urban-rural dual structure.

Hereafter the final conclusion was drawn: Although there are some problems to cope with the spring transport for the current China high-speed railway, it is believed that in the near future, the difficulty of buying a ticket in spring transportation will no longer hinder the homecoming of wanderers.

Keywords: China high-speed railway; Spring transportation; Ticket; Supply and demand

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1. Introduction

When the high-speed railway is mentioned, people's eyes in the world will focus on China. From nothing at the beginning to gradual gap filling by using the mature and perfect technology system, there are not only difficulties and frustrations, but also magnificent phenomenon all the way. Nowadays, when China enters the era of high-speed railway, the high-speed railway not only builds up a new life space for people, but also provides high-quality public products for the society and has become a powerful driving force for the economic

and social development. However, with the rapid development of China high-speed railway system, a series of problems are emerging, and especially in the spring transportation problem owned by China, the high-speed railway transportation is still facing problems and challenges.

2. Imbalance Between Supply and Demand of High-Speed Railway Transportation

2.1 Large Overall Demand for the Spring Transportation

In 2017, China high-speed railway has become the means

of transportation with the national longest mileage, the largest scale of construction and the most advanced technical level. However, in the face of the huge flow of people and the pressure gathered by population at a special time, demand in China high-speed railway operation still exceeds supply, and it is a difficult problem that the needs of all passengers can't be met.

According to the statistics of the National Development and Reform Commission, the volume of passenger flow during the spring transportation in China reached 2.978 billion passengers in 2017, which increased 63 million passengers compared with last year. According to the introduction of China Railway Corporation, 350 million passengers were sent during the spring transportation in 2017, which set a new record.

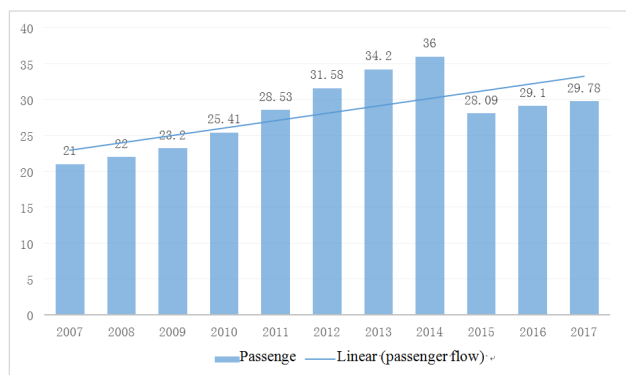


Figure 1. The Trend Figure of the Passenger Flow in the Spring Transportation in China from 2007 to 2017 (100 million passengers)

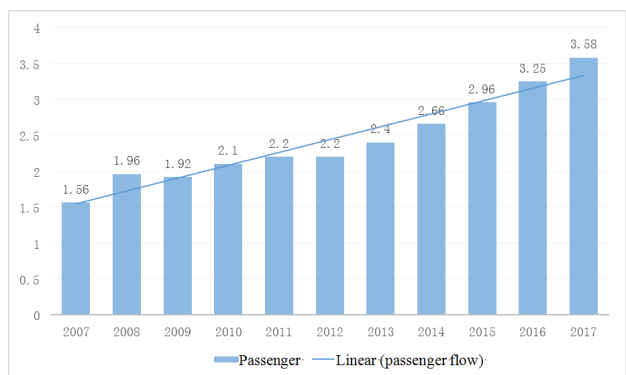


Figure 2. The Passenger Volume Sent by the National Railway in the Spring Transportation from 2007 to 2017 (100 million passengers)

The term "spring transportation", which was created by Chinese, has become a unique phenomenon of population movement during the annual lunar calendar Spring Festival in China. Its main body is mainly composed of

migrant workers and college students, and their common features are to stay away from their hometown.

2.2 Analysis of the Supply and Demand Curve Model

We will analyze the condition by establishing a simple economic model for the supply and demand of train tickets (see Figure 3). Where S_0 and D_0 indicate the demand and demand curve during the non-holiday period, and S_1 and D_1 indicate the supply and demand during the Spring Festival.

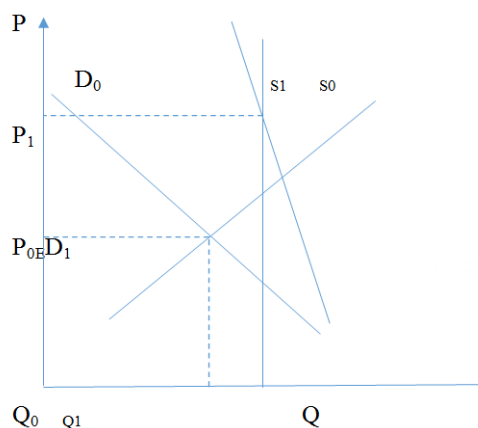


Figure 3. Train Ticket Supply and Demand Curve Figure

Firstly, analyze it from the perspective of demand. The increase in demand and the smaller elasticity can be clearly seen from D_0 to D_1 . Due to a large number of floating populations returning to their homes in the short term during the Spring Festival, a ticket for home is very valuable for them who miss their relatives, so the elasticity of the demand curve is smaller. With the Spring Festival in the winter, cars, planes and other alternative vehicles are easily affected by the weather, such as blizzard and wind, so the train will become the choice of the vast majority of people.

During the spring transportation, the supply and demand curve turns into a vertical line perpendicular to the horizontal axis, i.e., it has no elasticity. In other words, during the Spring Festival, the railway department has mobilized all trains and high-speed railways to exert their maximum supply.

From the whole point of view, the equilibrium price and the equilibrium demand have been improved, and as a public product, the government has limited the price of railway transportation and stipulates its highest price. At the highest price, the demand is set to Q^* , and the equilibrium demand is Q_0 , and at this time, the number of insufficient supply is $\Delta Q = Q^* - Q_0$, which increases the

consumer surplus, and in other words, there is a certain difference between the maximum ticket price and the actual price that passengers want to buy.

How to reduce the marginal cost and improve the allocative efficiency of resources is the key point to solve the problem. Though the country has been trying to break railway monopoly over the years, and as a national public infrastructure, it takes a certain amount of time for its market-oriented reform, the high-speed railway industry is temporarily regarded as a monopoly market. In the complete monopoly market, the manufacturers would like to maximize their profits, the necessary condition is $MR=SMC=LMC$, and in other words, the marginal revenue is equal to the marginal cost. However, because the monopoly manufacturers would like to get more excess profits, they will take some pricing strategies when pricing, for example, they implement differential pricing and three-level price discrimination strategy at times of peak demand and low demand. At the same time, the implementation of peak and off-peak differential pricing is also an effective solution when the demand is unsmooth, unstable and inelastic in time. The Ministry of Railways used to raise the price of tickets during the spring transportation, and in other words, the peak differential pricing strategy was adopted, and the purpose was to improve the allocative efficiency of resources and increase profits. However, as analyzed before, the ticket demand and supply price during the spring transportation has a very small elasticity, and the rise in the price during the spring transportation does not get an obvious control effect, but the rent-seeking phenomena are more frequent, such as "ticket scalper" and "backdoor purchasing".

3. The Theoretical Reasons for the Difficulty of Buying Tickets during the Spring Transportation

3.1 The Influence of the Incomplete Information on the Uncertainty of the Purchase of Tickets

During this Spring Festival, the author experienced the awkward situation of the difficulty in getting a ticket during "the spring transportation". During the winter vacation in 2016, the student ticket of high-speed railway can be booked 60 days in advance, and the adult ticket can be booked 30 days in advance. On the 30th day of countdown, the alternative tickets are sold out except for some first-class seats and business seats on the 12306 website.

Through the experience of ticket purchasing, the author sums up the following questions: student tickets are sold

60 days in advance, but only a small number of tickets are sold. In the first 30 days, tickets are almost purchased, and many of them have gone through the awkward experience of "it's over before it starts". If the purpose that tickets are sold 60 days in advance is to relieve the pressure of ticket purchasing for students going home on the vacation during the spring transportation and students find that there is no suitable ticket when purchasing a ticket since 30 days from the normal pre-sale period, this way of selling tickets is likely to cause the tension of tickets due to the incomplete information and the asymmetric information.

The so-called incomplete information refers to the whole knowledge of an economic environment state, which is not owned by the market participants. In the incomplete information state, passengers may not know the relevant purchase policy, or do not know whether they have chosen the most economical and reasonable way of transportation. Some migrant workers can't buy tickets through the network platform, and for them, the ticket buying channel is relatively single, and most of them directly purchase tickets to the manual service window in the station, so they know less about information channels in time. In addition, after the purchase of tickets, if a more suitable ticket is found, whether or when they refund tickets is also a dynamic game under the incomplete information.

Therefore, it is particularly important for railway departments to show the specific and comprehensive information to passengers in advance, and at the same time, they need to broaden and improve information channels and give appropriate helps when passengers have questions.

The ticket buyer also needs to pay attention to the relevant information in time, and tries to do the best to buy tickets as much as possible.

3.2 The Existence of Opportunity Cost

In the process of buying tickets during the spring transportation, there are often queuing purchase and non-value competition, and at this time, there will be the phenomena of rent dissipation. These phenomena are related to the problem of allocating resources and improving efficiency. Theoretically speaking, the ticket price of high-speed railway is lower than the equilibrium supply and demand price, but in fact, the price is not just the par price which can be seen and the waiting for queuing to buy tickets and the time and energy cost of buying tickets are the opportunity cost paid by people.

For the low-income people, their time value is not high, and in order to return home during Spring Festival, they are willing to pay their time, energy and queuing cost to get lower fares. For the most people, even if the ticket price is increased, the opportunity cost they may have to pay will not be much reduced than before, so they will still choose to queue as before.

To some extent, the measurement of the opportunity cost explains the reason that the ticket scalpers always exist and are difficult to suppress. Because of the difference between the actual supply and demand equilibrium price and the par price, the ticket scalpers have profit points. During the period of spring transportation with the limited ticket supply and demand and the increasing demand, even though the price is higher than the parity, a proper ticket saves the cost and burden of the passengers with a high time value, which is in line with the needs of the market.

4. The Practical Problems which China High-Speed Railway has During the Spring Transportation

4.1 Ticket Refunding Mechanism

The ticket refunding mechanism of China high-speed railway is one of the important reasons for the tension of tickets during the spring transport. Before 2013, no matter when passengers returned their tickets, only 5% of the fees were charged. Since September 2013, the provisions of China high-speed railway ticket refunding fees are as follows: if tickets are refunded 15 days before driving (not including the 15th day), fees shall not be charged; if tickets are refunded more than 48 hours before driving according to the par value, 5% of fees shall be charged, and 10% of fees shall be charged for more than 24 hours but less than 48 hours, and 20% of fees shall be charged for less than 24 hours according to the par value^[1]. However, during this spring transportation, if the date of travel for the ticket changed is between January 13th and February 21st, all the refunding fees shall charge 20% of the ticket price.

According to the above provisions, the smart Chinese net friends have found some ticket refunding loopholes, and have summed up the so-called "ticket refunding tips" to save the fees for procedures, and other people have formulated a comprehensive strategy for purchasing tickets after summarizing passengers' ticket refunding mentality. For example, in this spring transportation, a set of high-speed railway ticket refunding scheme is popular online,

and people say that the fee for ticket refunding declines from 20% to 1.76%, which bursts into an uproar. Finally, through the verification of railway departments, this difficult "ticket refunding tips" cannot save money and makes passengers overpay RMB 0.5 of ticket refunding fee. Although the fact has proved that this is a rumor, but "flies always find the cracked egg", which indicates that China high-speed railway ticket refunding mechanism still has problems.

During this year's spring transportation, and in the ticket lobby of the Foshan Railway Station, Foshan City, Guangdong, although it is in the peak of ticket purchasing during spring transportation, there are more people who refund tickets than those who buy tickets. According to the Foshan railway police, from December 22, 2016 to December 31, 2016, Foshan Railway Station has received 7,042 refunded tickets, and there are more than 700 returned tickets in a day, and the total refund is RMB 1,336,042.^[2]

The reasons for the passengers' ticket refunding are attributed to the change in the way of travel and the change of the travel. At the same time, because passengers can buy tickets online and the fees shall not be charged if tickets are refunded 15 days before the train leaves, many people have the mentality of "occupying tickets" and the phenomenon of repeated ticket purchasing. On the other hand, there are some passengers who are uncertain of and random about their trips, and they have the casual behaviors when they buy tickets. If they would like to buy a ticket, they will buy it and if they think the ticket is improper, they will refund the ticket through regarding buying a ticket as online shopping, and the circumstance that a passenger bought several tickets in the same period of time occurred.

As a public resource, train ticket is scarcer during the spring transportation, and the similar repeated ticket purchasing behaviors not only disturb the dispatching arrangement of Railway Departments to bring pressure to the service window of the railway station, but also cause shortage of ticket resources artificially to affect other people's ticket purchasing in time.

In addition to the large number of passengers who have not planned a good trip and the subjective factors of random and repeated ticket purchasing in the reason for this problem, the relatively simple way of ticket refunding and the low cost of passengers' ticket refunding are the objective factors. From the economical perspective, lower opportunity costs make passengers spend certain costs in

exchange for the maximization of the final result benefit.

4.2 The Influence of the Urban-Rural Dual Structure

In fact, the fundamental reason of "difficulty in buying a ticket" during the spring transportation is that the relatively lower level of urbanization in China than that of the developed countries for a long time and the urban-rural dual structure, thereby resulting in a large number of floating populations. The vast majority of these foreign populations will choose to return home in the Spring Festival, and are forced to migrate back and forth like "migratory birds" and it is difficult for them to settle down in cities. Therefore, there are still many second-generation migrant workers and third-generation migrant workers who are not yet included in the urban social security system, and they are only "urbanized" in this process.

5. Countermeasures and Relevant Suggestions

5.1 Price Fluctuation Mechanism

Since April 2017, railway enterprises have optimized and adjusted the ticket price announced by the China Railway High-speed train of the southeast coastal high-speed railway at the speed of 250 kilometers to 200 kilometers per hour. For the adjusted ticket prices, the amount of increase of the first-class seats is in the 65%-70% interval, and the amount of increase of the second-class seats is in the 25%-30% interval, and the specific ticket price will change with the change in seasons and volumes of passenger flow. The overall income level of the southeast coastal residents is high, and the appropriate rise in price will increase the demand elasticity of the high-speed railway during the spring transportation, and these residents will choose aircraft and other ways for travel.

5.2 Develop Substitutes

In European and American countries, the preferred means of transportation for a long voyage is civil aviation. In addition to some special geographical reasons, the fast transportation speed and the cheap and affordable ticket price are the reasons for attracting many passengers. In China, the choice of civil aviation is a high level of consumption, and most ordinary people who return home are unable to pay the price. However, in recent years, with the rapid development of high-speed railway, China's Civil Aviation has launched various activities of lowering the price to enhance its competitiveness, and the ticket price in the short-distance and medium-distance transportation is even lower than that of the second-class seats of high-

speed railway. The development of civil aviation can, to a certain extent, ease the pressure of the high-speed railway transportation during the spring transportation.

In addition, with the development of sharing economy, the short-distance passengers can choose to the shared vehicles as a means of transportation, which is economical and cost-effective.

5.3 Ticket Refunding Mechanism

As the spring transportation is the period with the largest volume of passenger flow in the whole year, the increase of ticket price can't solve the problem, and the pressure can be relieved by increasing the cost of ticket refunding. For example, the time of free ticket refunding is shortened to 10 days. During the spring transportation, the 20% procedure fee remains unchanged, but the proportion of fees will be increased at the second time of ticket refunding. At the same time, the quantity of changing tickets and refunding tickets will have the more stringent upper limit. The cost for passengers' ticket refunding is increased in these ways, so that they can carefully consider their purchase, thus improving the precision of ticket purchasing.

For the reason why the Ministry of Railways does not modify the ticket refunding mechanism, in the author's opinion, our country hopes that the public transport service facility can facilitate the masses and meet people's interests as much as possible from the perspective of people. After all, relatively speaking, because the ticket price of high-speed railway is high and some migrant workers can't purchase tickets online with the relatively single channels for them to buy tickets, there may be a wrong ticket purchasing. Recently, the high-speed railway has set up the range of floating price adjustment and the ticket price in some areas has been improved, so the original mechanism is still maintained in ticket refunding.

Under the environment of "internet +", the online ticket purchasing has deeply rooted in the hearts of the people. In January 2017, TaiYuan Railway Station recommended the automatic ticket refunding machine to facilitate passengers' ticket refunding, which also fully embodies the humanistic care of the railway department. When the convenience is provided, it hopes that passengers can buy tickets regularly and accurately.

5.4 Promote Urban-Rural Integration

In order to change the situation of "difficulty in buying a ticket" during the spring transportation, the urban-rural dual structure should be broken at its source and the quality and level of urbanization should be constantly improved to promote the balanced development of the re-

gional economy.

According to the statistics of the National Bureau of Statistics, from the urban and rural structure, the proportion of China's urban population in the total population (urbanization rate) was 57.35% in 2016, and the urbanization rate of the registered population reached 41.2%, and the population status with separation of living areas from their household in China (the population whose registered residence is not in the same town and street as the place of residence and who leaves his/her registered residence for more than half a year) was 292 million, which reduced 2.03 million compared with the end of the last year, in which the floating population was 245 million, reducing 1.71 million compared with the end of the last year^[3]. These data show that our country has made some progress in abolishing the urban-rural dual structure, which is fundamentally helpful to solve the problem of buying tickets during the spring transportation.

At the same time, we can start with the reduction of the demand for train tickets during the spring transportation, such as: the balanced development of the domestic economy makes migrant workers evenly distributed throughout the country and alleviates the problem of transportation before the Spring Festival, which is always operated from east to west and from south to north; the development of the economy in villages and towns can enable farmers to work nearby their homes; the migrant workers are encouraged to spend the Spring Festival in their working place to relieve the pressure of railway transportation.

6. Conclusion

Although there are still some problems in China high-speed railway, I believe that in the near future, with the

support of national policies and the rapid development of modern science and technology, under the cooperation of various vehicles, ticket purchasing will no longer hinder the homecoming of wanderers.

Recently, new progress has been made in China high-speed railway. With the levitation of Chinese "strongest communication satellite", passengers can also enjoy the WiFi service in the high-speed railway in the future; in the future, passengers can get on and off even the high-speed railways don't stop. Relying on the promotion of "The Belt and Road Initiative", it is no longer a fantasy to go to the world arena and connect Europe and Asia. The future high-speed railway should continue to conduct the good balanced regional development and better complement the advantages of road, aviation and water transport to improve the quality, safety and time value. China high-speed railway is an important for obtaining the Chinese people's confidence, and this card of China high-speed railway should be grasped to open up the farther and more beautiful scenery.

References

- [1] New Regulations on Fees for Ticket Refunding During the Spring Transportation in 2017[EB/OL]. Ministry of Railways of the People's Republic of China October 2016. (in Chinese)
- [2] Qiong Liu. Foshan Spring Transportation: Ticket Refunding is More than Ticking Purchasing, and a Passenger Buys a Train ticket Every Day[EB/OL]. Xinhua Net. January 2017. (in Chinese)
- [3] Xiaoyi Wang. National Bureau of Statistics of the People's Republic of China: China's Urbanization Rate Reached 57.35% in 2016[EB/OL]. China Economic Net. January 2017. (in Chinese)