

Research on China's High-Speed Railway Market Competitiveness Optimization

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Keywords: High-speed rail, Airway competitive, Market competitiveness.

Abstract. Under the background of transformation of China's railway industry management system and mechanism, railway industry faces the competition of airlines industry. The analysis of SWOT shows that interior advantages outweighs exterior advantages and exterior opportunities outweigh interior challenges, which tells us that the development of high-speed railway development in our country has a good internal and external environmental conditions. Therefore, product strategy, price strategy, channel strategy, promotion strategy, resource strategy, competition strategy, hub strategy and information strategy should be scientifically implemented and the high speed railway market competitiveness should be given to full play to improve product quality, to improve passenger consumer utility and to create additional value for passengers. Only in these ways, can the high-speed railway transportation income be further increased and can the sustainable development of railway industry be promoted.

After the medium and long-term railway network planning adjustments (2008) puts into effect, the high-speed rail network in China has begun to take shape. The railway industry in China is facing fierce competition from the civil airlines and highway transportation and market share in the passenger transportation is relatively declining. Therefore, high-speed railway in our country needs to improve product quality and service quality, build core competitiveness including market competitiveness. In this way, railway industry can actively cope with competition from the other modes of transportation, improve the operating performance of the high-speed railway, and promote effective shift mechanism of railway operation and management system in China, which are the major theoretical and practical problems that China's railway industry urgently needs to solve.

Introduction

Fast Development of High-Speed Railway Construction Operation in Our Country

According to the national the medium and long-term railway network planning adjustments (2008), by 2020, China's railway network scale is expected to reach 120000 kilometers, including 30000 kilometers in high speed railway, covering more than 80% of the city. By the end of 2015, China railway reaches 121000 kilometers and high-speed operation mileage is more than 19000 kilometers, accounting for more than 60% of the world high-speed operation mileage. It ranks first in the world both in road network scale and speed. Along with the high-speed rail network in our country, our country railway transportation capacity is increased sharply, greatly alleviate the tense situation of supply and demand, and lay a solid foundation to better the marketization operation.

Civil Aviation Coping with High-Speed Rail Market Competition

Since 2003, facing fierce market competition from high-speed railway, civil airlines adopted a range of comprehensive countermeasures, including cost strategy, network optimization strategy, VIP strategy, online check-in strategy, price strategy and so on. From 2010 to 2015, civil airlines and railway ticket data show that plane ticket price and railway price are becoming close, the average ticket price of plane is the same as ticket price of high-speed railway, and the average plane ticket price in some segment is even lower than average ticket price of the high-speed railway. With the rapid development of highways and civil airlines, railway transportation in China market share is declining from 11.8% in 1991 to around 5% in 2015. Therefore, because of high cost of the

high-speed railway construction and operation, in order to gain more market share, high-speed railway in our country, must take some measures to improve the market competitiveness, including pricing strategy.

China's High-Speed Rail Service Quality Needs to Be Further Improved

Factors influencing the passenger travel choice are: safety, punctuality, speed, convenience, price, service, and many other aspects, and in terms of service, railway makes more obvious progress compared with the past. However, compared with the civil airlines, there is still a big gap in the aspects of ticketing convenience, service standardization, product brand, the service consciousness and the extension services etc. Under the circumstance of fierce competition of civil airlines, high-speed railway in our country need to constantly improve the service quality, narrow the gap in the service quality, and maintain stable customer groups.

Opportunities and Challenge for China's High-Speed Rail Market Competitiveness

Since 2011, in the past the railway transportation conferences, Sheng Guangzu, Hu Yadong etc stressed that in order to better discover and solve all kinds of factors influencing the high-speed railway market competitiveness and improve the market competitiveness of railway transportation, we need to shift mechanism of railway operation and management system, maintain the railway transport enterprise market main body status, transform the mode of railway development, create brand of high speed railway,

The Problems of High-Speed Railway in Market Competitiveness

Failure solution of such prominent problems as low punctuality rate, unreasonable transportation product structure, weak marketing efforts, unreasonable capacity resource allocation way and outdated passenger transportation organization mode and station-train service way, leads to the situation that high speed railway in our country is facing new opportunities and challenges. Based on interview of railway experts, the paper further puts forward the actual problem influencing the high speed railway market competitiveness in our country. (1) The equipment problem. Overhead contact system is easy to appear problem in bad weather of fog, rain and snow; therefore the Beijing-Shanghai train would delay. (2) Problem of transfer from station to the other mode of transportation. The cohesion between railway station and urban railway, bus, taxi exists some problems, including physical and operational cohesion. At Beijing south station bus and subway is suspended at 11, but at 23.25 a high-speed railway arrives. (3) One-stop service. Railway is unable to provide hotel, catering, tourism, and other integrated services, losing a lot of source of income. (4) Policy problem of ticket system and ticket price. There is no frequent flyer program, no integral preferential policies, no peak season and off-peak season price and no peak and off-peak price, etc., which further exacerbate the problem that the capacity cannot make full use.

SWOT Analysis of High-Speed Railway Market

The paper employs the expert interview methods, issuing questionnaires to more than 20 railway problem experts. After they score and outweigh the factors influencing railway competitiveness, the statistics are as followed in table1.

Table 1. Analysis SWOT of high-speed railway

	internal environment	score	weight	weighted Rank		external environment	score	weight	weighted Rank
Strengths	(1)High-speed rails travel fast	4	0.05	0.2	Opportunity	(1)National policy support	4	0.15	0.6
	(2)High speed railway management team are highly capable	5	0.05	0.25		(2)Continuous implement of the medium and long-term railway network planning adjustments (2008)	4	0.1	0.4
	(3)Increasingly market-oriented operation and management system	3	0.1	0.3		(3)Support from local governments, investment and necessary policy support	2	0.05	0.1
	(4)Multiple unit save time within the distance of 1000kilometers	5	0.15	0.75		(4)Demand for commuting, business and other prospects are optimistic	4	0.15	0.6
	(5)Station of high-speed railway is near city center and passengers are easy to take.	3	0.2	0.6		(5)Transformation of enterprise management system and mechanism	5	0.2	1
	(6)“Harmony” has high brand awareness	5	0.15	0.75		(6)Strong market demand; railways, highways and civil aviation is growing fast	5	0.15	0.75
	(7)A large number of professional talents	4	0.05	0.2					
	(8)Agencies spreading all of the world	3	0.1	0.3					
	(9)Perfect information management system	4	0.1	0.4					
	(10)Most of market share in some areas.	3	0.05	0.15					
	subtotal		1.00	3.90		subtotal		1.00	4.1
Weaknesses	(1)Products structure and types should be better.	-4	0.2	-0.8	threat	(1) Countermeasures from civil airlines	-5	0.25	-1.25
	(2)Lack of high-speed railway management experience	-5	0.15	-0.75		(2)Cost of dispatching command, liquidation, and MU are difficult to control	-5	0.25	-1.25
	(3)Negative effect of multiple units accident	-4	0.25	-1		(3)Highway alternative competition is fierce	-3	0.2	-0.6
	(4)Station infrastructure should be improved	-3	0.15	-0.45		(4)Scale of high-speed railway development is slower and part of MU speed is slower	-3	0.15	-0.45
	(5)High target of construction standard and target speed, therefore fixed cost is high.	-4	0.15	-0.6		(5)Railway debt service is high	-3	0.15	-0.45
	(6)Joint development and multiple business support weak at the station	-2	0.1	-0.2					
	subtotal		1.00	-3.80		subtotal		1.00	-4.00
	Total advantages and disadvantages			0.10		Total opportunities and challenges			0.10

It can be seen from table 1 that the internal advantages outweigh the internal disadvantages in high-speed railway industry in our country, and the external opportunity is greater than the external challenges, which suggests that the development of high-speed railway in our country have a good internal and external environment condition, and the good internal and external environment condition in the railway industry laid a solid foundation for competitiveness optimization strategy.

The Factors Influencing China’s High-Speed Rail Market Competitiveness and Optimization Strategy

The Factors Influencing High-Speed Railway Transportation Product Market Competition

High-speed railway transportation product is the important carrier of the high-speed rail market competition, platforms, and support, and its quality directly reflects the market competitiveness of high-speed railway. Travel time, speed, distance, ticket prices, safety, convenience, comfort, service and other factors related to high-speed railway transportation product will affect the high-speed railway transport market competitiveness. According to consumer equilibrium theory, high-speed railway transportation product market competitiveness mainly shows through consumer utility, namely:

$$U = U(V, T, D, P, S, N, \dots) \tag{1}$$

Among these, U is utility function, T is time, D is distance, P is price, S is safety, and N is convenience.

Theoretical and empirical analysis show that among various factors affecting the market competitiveness and the high-speed railway transport products, travel time, convenience and punctuality rank high on the list, however, ticket prices, security, and so on is relatively minor factors. Therefore, by improving the related factors influencing the high-speed railway transportation product market competition, more passengers can be attracted to the high-speed railway transportation market.

High Speed Railway Transportation Product Market Competitiveness Promotion Way

Travel Time.

Time is a rare resource, time saving means people can devote more time to other productive activities. With the continuous improvement of people’s income, time value is also increasing. Saving travel time of high-speed railway or civil aviation depends not only on the running speed of the vehicle itself, bus also on the arrival time on the two ends of the high-speed railway station or airport. Within a specific distance, the total travel time by high-speed railway will be much less than the total travels time on a plane.

According to related researches, if V is the speed of plane, V_r is the speed of high-speed railway, ΔT is the saving time of high-speed railway, and then the distance equilibrium formula can be shown like formula 2 and figure 1.

$$S^* = \frac{\Delta T \times V_a \times V_r}{V_a - V_r} \tag{2}$$

From figure 1, we can see at the left area of balance point S, high-speed railway has the advantages, while at the right area, airline has the advantages.

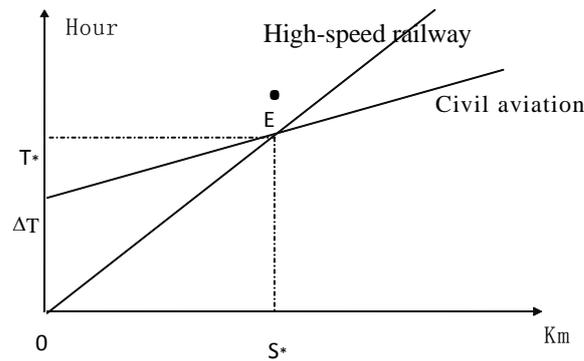


Fig. 1 High-speed railway and civil airline the same time and the same distance equilibrium chart

Convenience.

In the market of high-speed railway in China, passenger focuses on transportation product features such as convenience and quickness. China’s civil airlines system did a lot of research on high-speed railway and civil airlines competition relations analyzed the passenger travel and transportation mode selection. Convenience, saving time, punctuality is the major factors for passengers to choose the high-speed railway. Railway passengers pay more attention to convenience, total travel time and punctuality while air travelers pay more attention to the safety punctuality, price, comfort and other factors.

High Speed Railway Market Competitiveness Optimization Strategy.

Market competitiveness optimization strategy taken by high-speed railway in our country must put the high-speed railway transportation product as the starting point and end-result, and adopt multiple sets of optimum combination strategies including: price strategy, product strategy, channel strategy, promotion strategy, resource strategy, competition strategy, hub strategy, information strategy, etc., as shown in table 2. Among them, price strategy, product strategy, channel strategy, promotion strategy and so on are routine marketing strategies, while resources strategy, competition strategy, hub strategy and information strategy are market competitiveness optimization strategies with the characteristics of high-speed railway.

Table 2. High speed railway market competitiveness optimization strategy

Price strategy	1. Passengers segmentation. Different passengers and different ticket price;.
	2. Date segmentation. Different date (low and peak season. Off-peak and peak time),different ticket prices;
	3. Transportation market segmentation. Segment different transportation markets and make different tickets prices to meet different passenger’s needs.
Product strategy	1.Basic service. Meet passengers’ basic needs and expectation;
	2. Additional service. Provide before board, on the board and off the board service;
	3. Extensional service. Provide extensional service as accommodation, catering, amusement and sightseeing.
Channel strategy	1.Directly selling tickets in the station;
	2.Agencies selling tickets indirectly;
	3. Online selling tickets.
Promotion strategy	1.Publicize to enhance high-speed railway brand recognition;
	2. Enhance marketing to increase passengers experience and attract more potential passengers;
	3.Enhance the publicity on the news media to build up good brand and image
Resource strategy	1. Form the “4 length lines and 4 breadth lines “of the Chinese high-speed railway in the way of railway net;
	2. According to the target value of train running speed, traction energy consumption index, equip with economical multiple unit in the way of mobile equipment;
	3. According to the principle of “ensuring the project under construction, build the necessary project, and pay more attention to the mating project”, invest more in the important high-speed railway project.
Competition & cooperation strategy	Sign a cooperation agreement with the civil aviation, which provides passengers with “plane ticket and train ticket” seamless transportation service and adjust the high-speed railway and flight schedules to realize cohesion.
Hub strategy	Coordinate with city management department to make the time of high-speed railway and bus accorded;
	Perfect information issuing system and give taxi drivers some reward, and increase the amount of taxis;
	Co-ordinate with department of city planning and construction to speed up construction of urban railway and bus, and raise the level of the integration and integration of high speed railway station.
Information strategy	To enhance investment in high-speed railway informatization to promote information system construction process CTC ₂ ,GSM-R,ATPect;
	Train Operation Dispatching Command System(TDCS),transportation dispatching management system(TDMS);
	Enhance high-speed railway economic management information system construction to realize information share and exchange among the information system;
	Improve high-speed railway marketing and information service.

Conclusion

High-speed railway has good external and internal development conditions, and the external opportunities outweigh its internal challenges, internal advantages outweigh internal disadvantages. The transportation product is the main carrier of high-speed railway market competitiveness, and travel time, speed, distance, ticket price, safety, convenience, comfort and service will influence the market competitiveness of the high-speed railway transportation product. High-speed railway can adopt a range of strategies including price strategy, product strategy, channel strategy, promotion strategy, resource strategy, competition and co-operation strategy, hub strategy and information strategy and so on. In order to attract more passengers, high-speed railway give passengers more customer delivered value through improving transportation product quality, finally increase the market competitiveness.

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