History and Policies of Japan's Private Railway and its Lessons to China

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Abstract: This study aims to sum up the successes of private railway in Japan and offer theoretical and actual evidences for China to develop its private railway in the context of the changed economic structure. First, we analyze the history of Japan's private railway to find that urbanization had induced enough market for local railway and short of governmental funds gave the chance for private capitals to invest in railway infrastructure. Second, we review policies of encouraging private capitals to invest in railway infrastructure to find that governmental preferential treatments are necessary for private railway's development in Japan. Third, we analyze financial and management systems of Japan's private railway companies to find that diversified businesses and fund collections are two key factors for Japan's private railway companies to survive and compete with motorization. Finally we conclude that private railway can be success during the rapid urbanization, and further we put forth some suggestions for China to develop its private railway under the new economic structure.

Key Word: Private Railway, Motorization, Sub-urbanization, and Transportation Market.

1. Background

Governments of most countries finance transportation infrastructures since they are usually considered as public goods and huge amount of initial investments are necessary. However, private enterprises may principally invest in railway or expressway through the fare or toll collection. In fact, in several countries many railways and expressways are constructed and operated by private enterprises. For example, all railways in the US are owned and operated by private companies, while in Japan private and state owned railways have been developed simultaneously since 1880's. Even though Japan's National Railway (JNR) had dominated the railway section for a long time and all of the long distance trunk railways had been state owned, local private railway competed with national or public railways around metropolises seriously. Within the competition Japan's private railway grew up and became a necessary infrastructure for its economy development. Japan's government has also realized the importance and efficiency of private railway and offers many preferential treatments to them, and privatization of JNR to Japan Railway (JR) in 1989 is the most significant event in its railway history. However, there is no private railway in China at present. Reasons for this can be explained from three aspects. First, public ownership had been only permitted for a long time in China. Second, even after "Reform and Open" investment in transportation infrastructure is not completely opened, basically private or foreign capitals have not been permitted to construct and operate railway in China. Third, since the time of "Reform and Open" is relative short there are no powerful private companies to invest in railway infrastructure.

This study aims to sum up the successes of private railway in Japan and offer theoretical and actual evidences for China to develop its private railway in the context of the changed economic structure

through examining the history of Japan's private railway and analyzing the reasons and mechanisms of private enterprises investing in and operating railway in Japan.

2. History of Japan's Private Railway

Excluding JR (former JNR), there are total 126 private railway companies involving in passenger and freight transportation in Japan by the end of 1998. Among them fifteen are large-scale ones, six are relative large-scale ones and sixty-seven are small-scale ones. The left thirty-eight are joint ventures of governments and private enterprises (named "third sector" hereafter). Large-scale private railway companies often own several lines that extend hundreds kilometers, while some small companies own only one or two lines. For example "Kinki Railway" owns 28 lines that are about 600 km long whilst "Hiezan Railway" only has a 2km long line. Table 1 illustrates the developing situation of Japan's passenger railway companies in the last 35 years. It can be seen that JR and large-scale private companies changed little during rapid economic growth while MRT and middle and small-scale companies increased relatively fast. In fact, during this period, MRT increased from 4 to 10 and small-scale private railway companies increased from 80 to 101. Table 2 shows the carried passengers by classifying Japan's railways into four categories.

Table 1 Increment of the Length of Passenger Railway Lines in Japan (km, %)

Year	JR	Large-Scale Private Railway	Relative Large-Scale Private Railway	MRT	Middle & Small Scale Private Railway
1965	20,376 (77.8)	2,846 (10.9)	185 (0.7)	117 (0.4)	2,657 (10.1)
1970	20,520(78.8)	2,877 (11.1)	194 (0.7)	226 (0.9)	2,216 (8.5)
1975	20,963 (80.4)	2,836 (10.9)	205 (0.8)	289 (1.1)	1,766 (6.8)
1980	21,038 (80.3)	2,842 (10.9)	212 (0.8)	366 (1.4)	1,732 (6.6)
1985	20,479 (79.1)	2,817 (10.9)	212 (0.8)	439 (1.7)	3285 (12.2)
1990	20,175 (74.7)	2,863 (10.6)	179 (0.7)	514 (1.9)	3,285 (12.2)
1995	20,013 (74.4)	2,864 (10.6)	188 (0.7)	564 (2.1)	3,287 (12.2)
1998	20,059(73.8)	2,878(10.6)	187(0.7)	604(2.2)	3,455(12.7)

Table 2 Carried Passengers of Four kinds of Railways (Million Persons, %)

Year	JR	Large-Scale Private Railways	Other Private Railways	MRT
1965	6,721 (44.5)	5,168 (34.2)	1,042 (6.9)	2,71(14.4)
1970	6,534 (42.9)	5,983 (39.3)	1,128 (7.4)	1,591 (10.4)
1975	7,048 (43.7)	6,361 (39.4)	1,112 (6.9)	1,605 (10.0)
1980	6,824 (41.6)	6,629 (40.4)	1,151 (7.0)	1,797 (11.0)
1985	6,941 (40.5)	6,885 (40.2)	1,177 (6.9)	2,120 (12.4)
1990	8,356 (42.0)	7,835 (39.4)	1,055 (5.3)	2,646 (13.3)
1995	8,982 (43.6)	7,766 (37.7)	1,109 (5.4)	2,761 (13.4)
1998	8,748 (43.8)	7,336 (36.7)	1,173 (5.9)	2,724 (13.6)

It can be seen that numbers of carried passengers of private and JR are almost same, moreover during the 35 years market shares of them did not change dramatically and equilibrium has realized among them. However, passenger-km of private ones was only about half of JR's since private railways mainly operate local short distance lines while JR owns both long and short distance lines (Institute for

Transport Policy Studies, 2000). This division started from 1906-1907 when nationalization of private railways was implemented. Before that private railway had developed parallel with national ones in Japan. As the results of the nationalization, private railway is strong at short distance lines while state owned railway dominated the long distance ones, therefore, competitions between them mainly happened at middle distance lines.

Line structure of Japan's private railway had formed before Japan's rapid economic growth, while during rapid economic growth period private railways mainly improved the quality of the lines, such as double tracking and electrification. Japan's private railway initiated from 1880's when government adopted the policy to develop railway infrastructure both by public and private capitals. Japan's government had suffered from a lack of funds at 1870's because of large expenditure on introduction of Western technologies, compensation for former Samaurai deprived of feudal privileges and military expenses to quell civil uprisings of frustrated Samurai in west Japan (Aoi, 2000). Therefore, rather than developing railway solely by government the new established Meiji government gave private capitals the right to construct and operate railways after open of the first railway (Shinbashi-Yokohama). At that time the Civil Engineering Ministry insisted that railways be constructed and operated by government, while Finance Ministry actively insisted to develop railways with private capitals on the excuse of short of funds. Although this debate continued about 80 years, Japan's had to accept the idea of constructing railways both by public and private capitals after it permitted the construction and operation of "Tokyo-Aomori" railway by private capitals in November of 1881.

Compared to the capital shortage of the government, at the end of 19th century Japan's private capitals tried to find high profit investment fields. The first pure private financed railway – "HanKai Railway" that connected commercial city Osaka and Sakai city is just about ten kilometers, however, the actual passengers were much more than the forecasted one after the open of the line. Encouraged by this successful case, capitalists all over the countries began to plan to invest in railway, as the results fifty private companies applied for the permissions to construct railway during the years 1885-1892. These capitalists could be divided into four categories: a) financial combines such as Mitsubishi, Mitsui, and Sumitomo ect.; b) Railway capitalists who had been the merchants in Osaka and practice usuries; c) Capitalists from Kobe region such as Umiya Keijiro and some businessmen from Kyoto; d) Railway operators who had been the technical officials of railway section (Wakuda, 1981). In this context five large-scale private railway companies emerged. They are Nitetsu, Kansai, Sanyin, Kyutetsu and Hokutan. In addition to the five symbolic companies, during the prosperous period (1894-1899) lots of regional private railway companies were also established. For example, current Sinetsu main line and Osaka orbital line, Sibu-Xinjyuku line and Nakai Takano line were constructed at that time, former two lines were nationalized afterward while the later two are still owned by private companies. However, the nationalization of 17 private railway companies among the 37 companies in 1906 and 1907 affected the desire of private capitals to invest in railway and some bigger investors that had invested in railway tended to invest in other industrial fields.

Nationalization of private railway aimed to guarantee the dominant role of government on trunk railway lines. Although 1892 Railway Construction Law accepted the principle of railway nationalization, in reality, the government could not construct all the planned lines because of financial

problems (Aoki *et al*, 2000). Therefore, government still encouraged private capitals to develop local or regional short distance lines to improve the railway network. In order to encourage the development of short distance lines Japan's government enacted "Light Rail Law" and "Light Rail Subsidy Law" in 1910 and 1911 respectively. "Light Rail Law" adjusted some regulations applied in construction and operation of railway by private companies. For example, it simplified "primary license" and "basic license" into a single "license" and abolished the limitation of the highest fare on private railway. "Light Rail Subsidy Law" stipulated that in order to guarantee the 5% profit of private capital government would pick up a part of income from state owned railway to subsidy investors during the first 5 years. Benefited from the two laws boom of private capitals investing in light railway appeared during 1913-1915, and lines constructed during the period mainly connected the remote villages to their nearest national railway stations. Although the lines are relative short, they contributed to the development of remote regions very much. Main investors of these light rails are landlords, merchants and citizens along the line. According to Aoki of Tokyo Gakugei University the investors could be divided into four layers (Wakuda, 1981), namely citizens along the lines, enterprisers born along the lines, cooperators or traders of towns and villages along the lines and investors having nothing to do with the towns and villages but driven by the investing benefit. Since the authorities of the towns or villages often collected funds from the citizens mandatorily, the citizens naturally became the main forces of the investment.

In 1919 Japan's government abolished the "Light Rail Law" and "Light Rail Subsidy Law" to enacted the "Local Railway Law". Encouraged by the new law construction of private railway got hot again in 1920s. During this boom construction was mainly contracted in suburbs of big cities, especially around Tokyo. In the southwest of Tokyo electric railways named Ikeue line, Mekuro line and Tokyo-Yokohama line were opened in 1922, 1923 and 1926 respectively. Moreover, in the north of Tokyo Musasino line (present Seibu Ikebukuro Line) was electrified with two steps in 1922 and 1924. One the other hand, after electrification of Yiseizaki line and Tojyo line respectively in 1928 and 1929, Tobu railway opened the Niko line to connect Sugiko with Tobu, which is a 135 km long electrified lines. Private railway constructed many relative long lines in this time because railway was a high benefit investment field, even during the economic depression railway transportation could still gain stable incomes. Moreover, some politicians actively issued the permissions for private capitals to construct lines parallel with national ones. As the result, during 1921-1930, totally 142 private railway companies were born (Table 3 lists this situation).

Table 3 New Opened and Electrified Private Railways

Year	New Opened				Electrified
	No-Electrified	Electrified	Cable Railway	Total	
1921	11	3	0	14	2
1922	8	7	0	15	5
1923	5	3	0	8	5
1924	8	7	1	16	4
1925	4	10	2	16	6
1926	7	9	3	19	3
1927	4	4	1	9	8
1928	7	11	1	19	3

1929	4	9	3	16	5
1930	4	4	2	10	4
Total	62	67	13	142	45

Because many small and middle scale private railway companies that were established in the middle of 1930's borrowed big amount of money in their initial stage, some of them got difficult in business afterward. In the late of 1930's through the competition and government adjustment that aimed to encourage effectiveness, there were seven and five large-scale companies left in Tokyo and Osaka regions respectively (Kyosei, Tobu, Seibu, Kyoo, Kotakyu Tokyu and Kyokyu in Tokyo, Kintetsu, Nankai, Kyohan, Hankyu and Hansin in Osaka). Together with Meitetsu in Nagoya and Nisitetsu in Kita Kyusyu they were called big 14 and are the backbone of Japan's private railway. Their lines formed Japan's private railway's network before 1940 and the network structure was kept till now. The main work done by private railways after 1940 were perfection of the network, for instance in 1950's and 1960's private railway terminals were moved into urban centers, and after 1970 direct ride-through and construction of connecting routes between different companies' lines were carried out.

Two factors for the success of private railway in Japan could not be neglected, namely funds collection and business operation methods. In Japan you could not find a private railway company just involving in railway transportation, and income from no-railway sections accounts for largely in private railway companies. Since these two methods may give China a good lesson, we discus them in next Chapter in detail.

3. Financial Resources and Operation Style of Japan's Private Railway

In 1870's in order to deal with the shortage of funds to construct railway, Japan's government put forth some policies to prompt private capitals to invest in railway infrastructure. In the initial stage of private railway development investors were mainly the strength merchants who accumulated large amount of capitals through long time business. In order to maximum the profit of their surplus capitals they intended to invest in railway infrastructure. Similar to the merchants are big landlords, nobles and vassal kings. The common attributes of them are that they had large amount of surplus capitals, and they thought that they could construct a new line with the capitals if some preferential policies are given. However, since railway was a brand new at that time in Japan they usually could not forecast the actual needed investment and sometimes had to dissolve the companies in the middle stage of the construction due to running out of the owned funds. For example, Mitsui group together with other merchants applied for the construction of Kyoto-Osaka line, which ought to be the first private railway in Japan, but after they found that the needed investment would be much more than they expected they had to give up in 1873. The most successful case of private investment in railway was the "Nihon Tetsudo", certainly this success relied mainly on the preferential treatments given by the government. A very important politician – Iwagura established "Nihon Tetsudo" with public bond of nobles aiming at both encouraging economic development by railway construction and giving nobles livelihood. Because the constructed line between Tokyo-Takasaki was an segment of the line of "Tokyo-Aomori", which is planed by government aiming to prompt the development of undeveloped regions, government not only transferred construction land with low price but also guarantee 8% profit of the

company, furthermore National Railway responded for the civil work of the line. Actually "Nihon Tetsudo" was a semi public and semi private company to introduce capital of nobles to deal with the shortage of the government investment.

Except "Nihon Tetsudo" private railways were mainly financed by private investors and the situation continued till the end of 19th century. For example, in the case of lines financed by citizen of towns or villages along the lines, investors purchased stocks to become shareholders according to their ability. Shareholders could benefit from two aspects after the open of the lines. One is the fare income, because opened lines were often located in the soaring demand regions fare income was considerable. Another is the economic growth along the lines due to the open of the new lines. As the time passed large scale and good managed private railway companies survived the competition, and it was hard for new investors to enter into railway construction. The survived companies could maintain simple reproduction with their own capitals but had not enough funds to make enlarged reproduction such as extend lines, doubling or electrifying tracks. In order to quickly collect funds for enlarged reproduction, private railway companies abandoned the traditional method of issuing stock but borrowing money from banks or issuing enterprise bonds. Taking Meitetsu as an example from Table 4 we can see that among the 137 billions Yen capital increment during 1954-1961 about 45%t was borrowed from banks.

Table 4 Style of Capital Increment of Meitetsu during 1954-1961 (Meitsu,1994)

(Million Yen)

Fiscal Year	Borrowed				Enterprise Bond			Capital		Total of Change
	Change in one Year	Balance at the End of the Year			Issue	Pay back	Debt at the End of the Year	Increment	Capital at the End of the Year	
		Short Term	Long Term	Total						
1954	—	830	725	1,555	—	—	1,217	—	1,800	
1955	-5	825	725	1,550	700	170.7	1,746.4		1,800	
1956	610	1,745	415	2,160	200	242.4	1,704	900	2,700	
1957	2,165	2,995	1,330	4,325	260	296.5	1,667.5		2,700	
1958	739	3,125	1,939	5,064	580	338	1,909.5		2,700	
1959	-1,185	2,795	1,084	3,879	950	273.6	2,585.9	1,350	4,050	
1960	1,187	3,340	1,726	5,066	1,650	294.1	3,941.8		4,050	
1961	2,577	4,636	3,007	7,643	550	72.6	4,419.2	2,150	6,200	
Increment during 10 years	—	3,806	2,282	6,088	4,890	1,687.9	3,202.1	4,400		13,690
Split of the Increment				44.5%			23.4%	32.1%		100%

Besides capitals and borrowed funds, subsidies from governments are also necessary for the development of private railway. Although as the result of much attention paid to independent accounting of transportation enterprises government did not fully subsidy private railway in Japan, small and middle scale private railway companies still obtained many kinds of subsidies. This is because that similar to state owned railway, electric and gas utilities, private railway is also a part of public utilities, governmental subsidies should be supplied when private railway companies meet

financial difficulty. Since short of funds Japan's government had often subsidized private railway with methods of providing land with low price and letting National Railway responsible for civil works for private investors. Among them the most incentive subsidy was that government often guaranteed private investors to have a certain investment profit during the first 5-10 years after open of the new lines. It means that in the case of fare income could not reach the expected level government would subsidy the shorted part. Meanwhile local government along the lines would also subsidize somewhat or might purchase a part of stocks to become one shareholder of the lines. Latterly governmental helps included subsidies, low-interest loan from governmental lending institution, financing funds, activities of Japan Railway Construction public Corporation (JRCC) and exemption of some taxes. These supports consist of two lines, one is construction subsidy for civil works and improvement, another is operational subsidy to eliminate deficit and enforce business ability. We list governmental support system for private railway in Japan in Table 5. From it we can see that Eidan railway (Teito Rapid Transit Authority Subway), public owned railway and railways of the third sector obtained more preferential treatments (Saito, 1993).

Table 5 Governmental Subsidy System for local railway transportation

Region	Type of subsidy	Beneficiary	Contents	Ratio by Nation
Metropolis	Subway construction fee	Eidan, Public Railway	70% of the cost (Actual 59%)	1/2
	Satellite city railway construction fee	Public Railway	36% of the cost (Actual 28%)	1/2
	Urban new transport construction fee	Public Railway and the third sector	45-57% of the cost	5.25/10
	JRCC and private railway	Private railway	Interest subsidy if loan interest over 5%	1/2
Local	Subsidy for deficit	Local private railway	50% of the deficit	1/2
	Cost for equipment modernization	Local private railway	20% of the cost	1/2
	Cost for Improvement of crosses	JR and private railway	50% of the cost	1/2
	Transfer grand	The third sector	Upper limit 30 million Yen/km	1/2, 1/3
	Transfer grand and deficit subsidy	The third sector	50% of the deficit (in first 5 years)	
	Subsidy for local new line and open	The third sector	Upper limit 10 million Yen/km	1/1
	Subsidy for local new line and deficit	The third sector	40% of the deficit (5 years after open)	1/1
	JRCC and AB line subsidy	Railway construction cooperation	Construction cost of new local lines	1/1
	Education subsidy	The third sector and local private railway	Uncertain	2/5
Others	Hazardous grand	Victim	Uncertain	1/4

Even though governmental support is essential to private railway, its effects are temporarily. If private railway companies were not good at management and operation they would not be able to survive. In order to survive all Japan's private railway companies involved in diversified businesses, they tried to fully utilize the lines by engaging in related businesses. In most private railway companies incomes from railway department only account for half of the total. All large-scale companies have established

non-railway branches to enlarge their business into land development along lines or urban redevelopment around terminals. Large-scale private railway companies have become the comprehensive business operators. The most successful one is Kintetsu Group, which consists of 155 sub companies, their businesses covers road passenger transportation, land development, department stores, hotels, travel agencies, manufacture of railway carriages, damage insurance, advertisement planning and recreation facilities. Although railway income accounts for about 60% of the total in Kintetsu Railway sub-company, which is the highest among all private railway companies, railway income only accounts 5.7% of the total in Kintetsu Group in 1990. Compared with Kintetsu, Tokyu, Seibu and Hankyu have already gone beyond railway field and given up the business style of developing along their lines. They have become the symbols of metropolises.

Located at central Japan Meitetsu strengthened its comprehensive capability through carried out middle term planning during 1975-1985, it enforced the cooperation among its sub branches and accumulated management powers in the group with unified technique and management standard. Business splits in Meitetsu Group is shown in Fig. 1, it illustrates that business volume of Meitstsu railway that is the core in the group just accounted for 10% of the total, while business volume of road transportation and shopping center or department almost accounted for 60% of the total. Moreover, business volume of land development accounted for 10% of the total, although the share of land development is not big its net profit had accounted for 50% of the total during 1970s (oil shock) and 1980s (bubble economy).

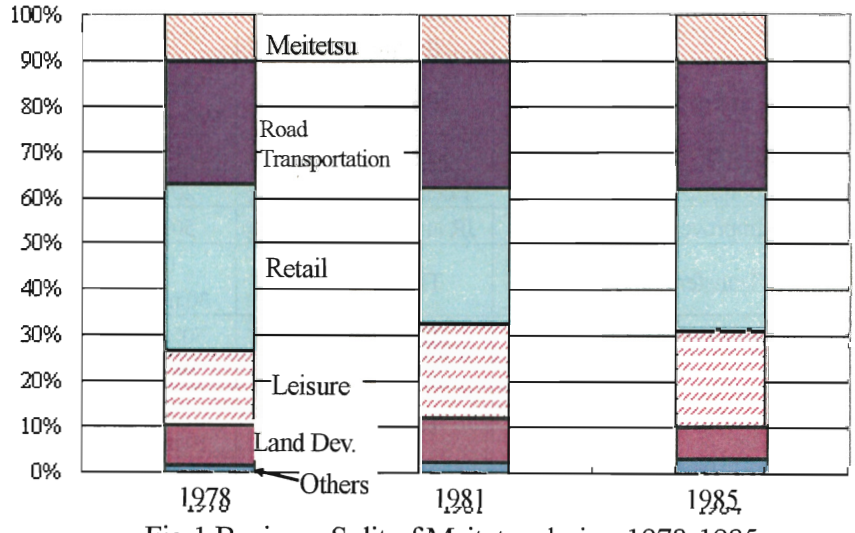

Fig.1 Business Split of Meitetsu during 1978-1985

Diversified businesses of Japan's private railway companies started from Hankyu in Kansai region. Since there was not enough trackside transportation demand when Hankyu was established to construct the railway between Osaka and Kobe, trackside development to induce passengers was essential for its survival. Before the open of the line, Hankyu distributed a pamphlet named "the most hopeful train" to introduce that the company would develop apartment complexes along the line and make positive role for travel and leisure. As the result the developed Ikeda apartment complex was completely sold in the second year after open of the line to make a success in development along self's lines. Afterward the diversified business of Hankyu extended to hotel and transportation terminal. These successful examples became models of diversified businesses of private railways. Especially

they affected the private railway companies in Tokyo region seriously. In Tokyo diversified businesses were carried out in an opposite way. The pioneer of diversified businesses in Tokyo region was Tokyu. Its predecessor was a sub-branch of "Garden City Co,.Ltd" that developed apartment complexes around the suburbs of Tokyo and the characteristics of its diversified businesses was development of apartment complexes earlier than railway construction. After land development Tokyu constructed the commuting line connecting suburban apartment complexes with Yamate circle line in downtown of Tokyo and established an independent railway subsidiary company. Afterward Tokyu developed not only apartment complexes but also some leisure facilities such as Harbor-Island hot spring, Tama Park, Yomiuri Park along the lines. Moreover, it opened an apartment in Sibuya of Tokyo and also induced some universities to locate along its lines to guarantee enough passengers.

In addition to diversified businesses, joint operation between private and public railways is also essential to the development of private railways. As the increment of car ownership railway transportation faced serious challenge from motorization. In order to survive private railways must improve services such as use of new comfortable carriages, setting up rational fare system and increment frequency, while the most important improvement is to decrease the time and cost between origins and destinations. In Japan's metropolises there are often several companies operate many railway lines and both competition and cooperation exist among them. Basically private railways are located in suburb, when private railways' passengers in remote area entered downtown they have to transfer to subway at the boundary of suburb and city, this increases not only the travel time but also cost. Therefore, direct through without transfer will be the best method to improve railway service and further competition ability. During its mature period many direct through civil works were constructed in Japan's urban railway network. Although this is very complex and involves technical criteria, fare and financial systems of all railway companies, it improved the efficiency of the whole railway network greatly through realizing seamless transfer. For example, the direct through among subway No. 3, Meitetsu Inuyama line and Meitetsu Toyota line in Nagoya in 1986 extremely improved the efficiencies of the three lines, Inuyama and Toyota lines are the most profit lines of Meitetsu since then.

4. Lessons from Japan's Private Railway and Strategies of China

From the developing history of Japan's private railway we can say that urbanization created enough market for railway transportation and private capitals could invest in local passenger railway successfully in the context of market economy. Government should treat local railway transportation as a business to encourage large-scale private enterprises to invest in it and guarantee them to have a certain investment profit. Japan's private railway obtained high investment profit before motorization and some large-scale private railway companies have become the models of diversified businesses operators. The higher investment profit and efficiency of Japan's private railways is due to the introduction of competition into railway construction and operation.

Similar to the urbanization happened in Japan, urbanization in China is advancing rapidly. Share of urban population in China increased from 17.9% in 1978 to 32.0% in 2000 (Zhang, 2001). On the other hand, considering the low car-ownership and high ratio between car price and the income it can be said

that a relative long period will be needed for motorization in China to reach a high level. Therefore, now might be the best chance for China to develop its urban railway system. In fact, China has realized this situation and made great efforts to invest in urban railway system, at present about 20 cities have the plan to construct urban railways (Wei, 2001). We think that during the construction boom China's government should introduce competition to let private capitals to involve. From Japan's experiences it can be found that in order to establish a perfect local railway network government should construct and operate railways in downtown, while private companies can construct and operate railways at suburb and to satellite towns (Niitani, 1999). This can not only solve the shortage of governmental capitals but also offer a high profit investment filed for private capital, further it can also break down monopoly of public capitals on urban railway transportation to improve the service of public transit. For example, because of the high land price in down town land developers are fond of developing apartments complexes around suburbs in China's metropolises. As the result many small zones were constructed around the cities, commuting and shopping/leisure from the zones to the downtowns demand lots of transportation service, it created market for railway supply. Therefore, construction and operation of railway connecting the zones with downtown might be a high profit investment filed, government should encourage ability-having land developers to construct the connecting lines and require them to plan railway construction simultaneously as the land development. This can not only enlarge the investment scale but also raise the value of the apartment with improved accessibilities. Many Japan's private railway grew up in this way. Perhaps there is not a ability-having land developer in China to construct and operate local railways, but government can set some preferential policies such as free use of construction land to help the land developer to construct suburb railway lines, government can also organize several developer into a railway joint venture.

On the other hand, in Japan private railway companies had extended their business out railway after they grew to a certain degree. In addition to operating departments or shopping centers in their terminals, the best business was considered as the development of trackside land. As we analyzed in Chapter 3 income from land development accounted for a large part in Japan's private railway companies. This method is most suitable to lines connecting satellite towns with downtowns, because passengers in satellite towns are often not enough for corresponding railway's capacity, railway companies has to develop apartments or office buildings along the line to produce more transportation demand as well as benefit from land development. As the result population and industries would concentrate along the tracks to avoid dispersed land use and then control car traffic increment. Therefore, government should guarantee private railway companies to have monopolized land development right along their tracks when require land developer to develop railways between satellite and down towns in China. This method is much more feasible than levying benefit taxes on land developers after construction railway by government.

Even though the role of private railway cannot be neglected in Japan, in downtown the main transit system are still public railway and JR lines. Formerly, terminals of private railways were often constructed at urban outskirt, letting the terminals of private railways entering urban center started in Osaka. Private railways serving suburb that did not connect with other public lines or directly going through downtown were inconveniences to passengers and affected their function. For example, although terminal of Inuyama line of Meitetsu is just ten minutes walk from the nearest subway station,

it seriously hampered its development. After Meitetsu's trains directly going through subway's line its passenger increased a lot, this verified that seamless transfer or direct through among transit systems is important. In Tokyo subway cooperation paid much attention to leaving spaces in the two ends of a line for lines of other companies to connect or directly go through when new subway line was planned. Because of the short history, urban rail transit system in China is often responsible by one public company. However as the diversification of the railway investors in China, government should organize the cooperation among several investors to realize seamless transfer or direct through among different lines. The cutting off situation that has happened between urban railway lines and the lines of railway ministry should be avoided. Compared with technical problems the most serious difficulty among direct through are fare system and division of income between them. In order to solve this difficulty compromise is needed and lines' owners should take the long-term benefits into account.

Diversified business contributed Japan's private railway much, however, some companies involved too many fields to success. It is easy for them to success in the field closely related to railway transportation, while many companies failed in operating shopping center and theme park. This is also the reason why a part of private railway companies were caught in operation difficulty now. In fact a part of diversified businesses became the burdensome due to the long economic depression in Japan. From this lesson China's private railway companies should avoid becoming too wide, and government should prevent them from the business having nothing to do with railway transportation and induce them to engage in fields which have synergism effects with railway transportation.

The last point is that local passenger transportation is closely related with daily lives of citizens, in order to offer transportation service fitting high demand in metropolises and low demand in dispersed populated regions it is unreasonable to put local railway into market completely. Government should support private railway by offering preferential policies and subsidy. These helps include establishment of independent joint venture by private and urban government or lending government constructed railway to private companies.

5. Conclusions

Urbanization created enough market for urban railway supply, while short funds hampered government to construct enough urban railway. Therefore, private capitals should be allowed to invest in urban railway system in China. Meantime, in order to encourage the private capital invest in urban railway and make success, governmental preferential treatments are necessary. Finally, diversified businesses is very important for private railway companies to survive during motorization.

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