

# **9<sup>TH</sup> CONFERENCE ON COMPETITION AND OWNERSHIP IN LAND TRANSPORT**

## **JAPANESE EXPERIENCES WITH PUBLIC AND PRIVATE SECTORS IN URBAN RAILWAYS**

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### **INTRODUCTION**

In Japan private railway companies are common and play an important role in passenger transport, especially in urban areas. They are financially independent and in most case their rail operation makes profits. The considerable number of private railways provides adequate urban public transportation services without governmental support system. Their total costs that include investment costs are covered by fare-box. This contrasts with most systems in other industrialized countries. In most industrialized countries public ownership, subsidies, operating deficits, and inefficient operation are general recognition when policy makers discuss the provision of the urban public transportation.

As a matter of principle, the public transport system has two basic objectives that are expected to achieve simultaneously: to sever the public interest and to be efficient. However, the two objectives can sometimes be in conflict. Thus, the policy must focus either on the public interest ('mobility first' principle) or on profitability at the outset. Basically speaking, the Japanese rule has been that urban railways and other public transport bodies should pay for their own costs, while making exceptions in special cases. That is, the national government still maintains a strict policy of "self-supporting" (or "full-cost principle") for public transportation. Under these policy schemes, operator may promote commercial objectives. Given this principle, the national government set up several special subsidy programmes for

special cases, mainly for the new line construction projects, which need massive investment costs. But, these subsidy programmes had been applied the lines provided by public and semi-governmental bodies, but not for private railways.

The Japanese case provides us with a role model that may lead to increased private provision of public transport services. However the system meets the problem that the subsidy programmes has been not applicable for most efficient rail operators: private railways. That is to say, to get the funds from the governments to ease the financial problem of the new line construction, the local community have to employ the public (or semi-public) operator; even people know that the public operator has lack of enough management capability especially in terms of efficiency. On the other hand, even if a need exists for rail services, for example to accommodate residents of new towns or to make it possible to through operation, it is not easy for the private sector to enter the market. A huge investment for a private railway company would be risky.

Furthermore, because of a steady increase in auto ownership and use, many railway operators face the declining markets. Therefore it becomes more difficult to thrive the rail business even for the most efficient management under the self-support principle. But, basically, governments tend to deny supporting private railways financially; even everyone knows that private railways are more efficient than public counterparts. Thus when the rail company to decide to cease the rail services of a line, the community again have to use public railways, even if the rail services has more social benefits than transformed bus services.

To solve these policy problems, discussions have started to search the smart way of subsidy programmes which might be applicable for private (directly or indirectly) and dose not have disincentive for the privates' efficient management system. There are a few attempts to solve problems. At the moment, these attempts tend to use the operation-infrastructure separation type idea even that people recognize the disadvantages of this treatment.

This paper we first provide a brief overview of rail transport in Japan, mainly for urban. The paper then explains the self-supporting principle, subsidy programmes in Japan and consequences of the rule that prevent private railways from being granted subsidies. Finally, we will show a couple of schemes to tackle these problems and discuss the efficiency of the arrangements that allow private railways to benefit indirectly from subsidisation, such as separate infrastructure companies.

## **A SKETCH OF URBAN RAIL TRANSPORT IN JAPAN**

This section gives an overview of regulatory policy and status of the Japanese railway industry. First, we will describe types of rail license in Japan and categorize railway companies. Then we will give a brief over overview of the performance of private railway companies and their diversification strategy.

## Entry regulation

Before a railway company may provide railway service, it must first acquire a rail license in Japan, subject to approval by the Ministry of Land Infrastructure and Transport. The duration of the license is unspecified, so that once a railway company is established, it may continue to operate indefinitely, as long as it creates no serious management problems such as safety threat. However, it is logical consequence to terminate rail services if the rail operation is no longer financially sustainable, though a railway company have to report the Ministry (and relating local governments) one year before to cease supplying service. Because private railway companies on a commercial basis operate most rail services, it is possible that the company transform one of (or, in some cases, all) rail services to bus operated services by themselves if the community agree this transformation.

In April 1987, when the Japan National Railway was privatized and divided into separate railway companies, hereafter referred to as Japan Railways (JRs), three kinds of railway licenses were created, as shown in Table 1.

**Table 1. Kinds of Rail Service Licenses in Japan**

Kind of license	Type	Basic Description
Class 1	Operation-infrastructure integrated provider	Enterprises that provide rail passenger and/or freight services while holding their own rail infrastructure
Class 2	Operation provider	Enterprises that provide rail passenger and/or freight services using rail infrastructure owned by another organization
Class 3	Infrastructure provider	Enterprises that build rail infrastructure for sale to a class 1 enterprise, or enterprises which own infrastructure and rent it to a class 2 enterprise

Most Japanese companies hold a Class 1 license, as they provide service operation on rail infrastructure they own themselves. This license, then, is granted to vertically integrated railway systems, while both Class 2 and Class 3 rail licenses are issued to companies with vertically separated rail systems. Class 2 licenses are for companies operating on borrowed tracks while Class 3 licenses are for companies providing the infrastructure that Class 2 license holders use. Holders of Class 2 and Class 3 licenses are rare. The Japanese Class 2 railway company which borrows infrastructure is different from operation-only railways in Europe, which typically own no infrastructure. Almost all Japanese Class 2 rail holders, in addition to borrowing track from outside companies, own their own tracks on different lines as well, so that these companies are in fact both Class 1 companies because they own their own infrastructure where they operate their own trains elsewhere and Class 2 companies because they borrow other companies' rail tracks along parts of their total line hauls. The roles of such companies usually involve extended operation to some specific facility or area such as an airport or suburban new town, or interconnection among different rail operators within a city.

## Operators

In Japanese passenger transportation, private railway companies play an important role, particularly in large metropolitan areas. Although, trends indicate an increase in auto use and ownership and stagnant or gradually declining rail ridership, rail transport maintains a reasonably high modal share of total trips in Japan. In 2000, on a countrywide basis, the rail modal share of motorized transport in terms of passengers was 26%. If only the three large metropolitan areas are considered this figure increases to 49%<sup>1</sup>. And the share of private railways of all rail transport was 41%. Especially, the percentage of Osaka ('Kei'-'Han'-'Shin') metropolitan area was 49%, which was highest. Even the lowest private rail share in rail passenger market was 38% (Tokyo metropolitan area).

There are 170 railways (which include tram, monorail and automated-guided-transit operation) operators providing passenger service in Japan. Some of these companies are Class 3 operators. In most case the operators only provide passenger services. The Ministry utilizes eight categories for passenger rail operators; JR (6), 'Majors' (15), 'Jun-Ote' (Medium) (6), 'Minors' (112), TRTA (1), Municipals (12), monorail (9), and AGT (Automated Guideway Transit) (9).

**Table 2: Classification of Passenger Rail Operators in Japan**

<b>Operators</b>	<b>Legal Classification</b>	<b>Ownership</b>	<b>Service Type</b>	<b>Main Service Areas</b>
<i>Large private</i>	Private Corporation	Private	Urban (in most cases)	Large Metropolitan areas (e.g. Tokyo, Osaka, etc.)
<i>Medium private</i>	Private Corporation	Private	Urban	Large Metropolitan areas (e.g. Tokyo, Osaka, etc.)
<i>Small private</i>	Private Corporation	Private	Local (and Urban)	From large to small urban areas and rural area
<i>Transformed Third Sector Railway</i>	Private Corporation	Public-Private	Local	From large to small urban areas and rural area
<i>JR</i>	Special Corporation	Public and Private	Inter City and Urban	six Regions in Japan
<i>TRTA</i>	Special Corporation	Public*	Urban	Tokyo
<i>Municipal</i>	Public Organisation	Public (local government)	Urban	Tokyo, Osaka, Nagoya and 6 other large cities
<i>Monorail</i>	Private Corporation	Public-Private partly private	Urban	Large Metropolitan areas and large urban area
<i>AGT</i>	Private Corporation	Public-Private	Urban	Large Metropolitan areas

Source: Mizutani (1999) Table 1.1

Note: The author made several changes from original tables. As we explained, there are some exceptional cases, especially in the ownership categories.

<sup>1</sup> In 1990, these numbers increased to 28% and 51% respectively. In 1980, the modal split of rail transit in Japan was 35% and 53% in metropolitan areas. In 1970, the percentages were 40% and 55%.

'Majors' provide service mainly in Japan's three large metropolises with the exception of Nishitesu, and are all pure private companies. 'Jun-Ote' provides services in and/or on the outskirts of metropolises but not to the extent of the 'majors'. Three of those firms are quasi-private (49% or less of the shares are owned by the public sector). 'Minors' consist ex-JNR and authorized-Shinkansen (bullet train) construction related 'Transformed Third Sector Railway's' (42 which include one Class 3 operator and all are quasi public: in most cases 51% or more the shares are owned by the public sector) and small local operators which provide rail services in the less densely populated cities of Japan ('small-private', 70 which include eight Class 3 operator. Some of 70 companies are public-private mixed companies but in most cases private companies), TRTA (Teito Rapid Transit Authority; now it calls Tokyo Metro Co. Ltd.) provides the metro (underground) rail service in Tokyo area and is the special corporation (it due to fully privatized in FY 2007). Municipal provide metro (in most cases underground) services, except three companies which only run tram system, and all municipal are pure public corporations (authority). Lastly, monorail and AGT are Quasi-public (51% or more the shares are owned by the public sector) with a few exceptional cases.

A majority of the Japanese private railway companies started operations around the 1900's and have long business histories. However, unlike the financial problems and bankruptcies that plagued operators in most other countries, most private Japanese railways continue to operate successfully to this day.

### **Private railways and their diversification strategy**

The 'Railway Nationalization Law', which went into effect in 1906, restricted the activities of the private railway firms. Under the law, private firms were restricted to the local (regional) services and the use of or creation of lines that basically didn't interfere with government lines directly. Thus it travelled through areas with relatively limited populations. While private firms anticipated that railway operations could be self-supporting, limited population bases forced companies to 'generate' a steady ridership for rail operations. This led to the greater utilization of a business diversification strategy.

Japanese private railways have long been permitted to operate non-rail businesses in addition to the rail business. To be precise, there has been no regulation to do non-rail businesses as far as it has been rational behaviour as a business entity. Therefore, it might be rational and understandable "corporate" behaviour, given the steady but low profitability of the rail business and its "vulnerability" to political intervention. In fact many private railway companies engaged in non-rail activities from the outset.

After many decades of experience in a multitude of services, the private railway companies of Japan have proven to be highly successful. The highly positive reputation of Japanese railways is mainly due to these private companies. Their success can easily be measured by the penetration of railways in everyday life. They have achieved a high social status by offering not only impeccable transport services – to a large degree due to extensive preventive

maintenance, highly trained personnel, quality control systems and strong customer orientation – but also by diversifying and bringing forth quality amenities, products and services in their region. The importance of non-transport activities is brought forth in table 3. In addition to in-house diversification, most private railways also form multi-company groups. These companies do not see themselves merely as diversified companies, but rather as ‘life-style developers’. (van de Velde 2002).

**Table 3: Revenue percentages of the majors and Minors (1995)**

FIRM	Number of Firms	Diversification index <sup>4)</sup>	Operating level profitability <sup>1)</sup>	Revenue percentages			
				Rail Division	Transportation Division	Real Estate Division	Other Business Division
Majors	15	42.87	115	51%	11%	21%	17%
Minors	63	40.43 <sup>3)</sup>	101	38%	32%	13%	17%

Note: 1) operating level profitability is defined as operating profits divided by operating costs (including depreciation).

2) the numbers are simple average of each category companies

3) the weighted average of DI for Minors was 59.55.

4)  $DI = (1 - \sqrt{\sum P_i^2}) * 100$  where  $P_i$  is the percentage of revenues attributable to a discrete business

The diversification is not to randomly diversify but to diversify with the strict goal of increasing rail ridership<sup>2</sup>. The focused, methodical, long-term strategy has given the transport providers a reliable base of ridership. In simplistic terms the flow of development proceeded in the following way. In most cases, they started the diversified operations, including housing development, amusement parks & other attraction facilities and lights & electricity, from the very beginning of the firm’s history. These residential development and leisure facilities helped to build up the rail passenger traffic in the vicinity of the rail lines. In sometime, access services between rail lines and those developed areas (or facilities) located at a distance from the rail infrastructure were created to vertically support railway operations as well as to operate as independent entities. Stations were developed to meet the needs of riders who pass daily through the stations. Later, private railway companies extend their business targets not only railway passengers but also the people who live near the railway lines. Station development included the construction of department stores, office buildings, the development of other retail space and other consumer-related businesses. By the 1920’s the pioneers in railway diversification proved successful, and soon others followed. National Government did not stop this, probably because this is purely commercial decision and it does not cause big troubles.

On the other hand, National Government made the rule: ‘Railway Accounting Regulations’ (*Tetsudo Kaikei Kisoku*). Under the regulations, a railway company is forbidden to allocate rail and non-rail costing at its own discretion. Regulations dictate how to allocate costs for common facilities and administration. Therefore, an intentional cross-subsidy strategy, whereby a railway company charges low fares at the expense of non-rail businesses and vice versa is unlawful and thus avoided. So, in Japan, rail business activities and non-rail business

<sup>2</sup> Please refer; Shoji, (1993), Killeen and Shoji (1997), Shoji, (2001), Shoji, and Killeen (2001), (2002).

activities are strictly separated by this official manner.

The absence of cross-subsidisation does not mean that there are no interdependencies. Besides the strong focus on the customers' needs, a very important reason for the success of both rail and non-rail activities is the synergy created between the two activities. Japanese private railway companies are capable of following such a flow which enables companies to internalise some of the externalities that were created by the development of their infrastructure and to attract passengers to railway operations. In addition, as a company moves along the experience curve, valuable knowledge and experience can be utilized to expand or to enter new markets. As a result, Private initiative allows the development of long-term strategies that are not possible under political cycles. It appears that diversification is a rational strategic choice.

## **SELF-SUPPORTING PRINCIPLE AND PRIVATE RAILWAY**

In principle, Japanese national government policy dictates the self-supporting principle even for the small privates. The basic rule has been that urban railways should pay for their own operation and infrastructure cost. Therefore, when we calculate the ratio of fare revenue to operating costs that exclude items such as depreciation and interest on debt, it is greatly exceeding 100%. Although there is some on-going discussion relating to this point, most private companies operate on a pure commercial basis. Therefore, the private railway providers receive, at most, nominal subsidies while providing government coffers with corporate tax revenues.

### **Fares and determination of service levels**

Passenger fare levels of all companies are regulated by the Ministry based on the Railway Enterprise Law. There are two important points in fare regulation. First, rail fare must be approved by the Minister of Transport<sup>3</sup>. Second, the Japanese railway industry is based upon the full cost principle. The rail fare should cover rail costs including the operator's profits<sup>4</sup>. Generally speaking, railway enterprises are expected not to receive subsidies.

To be precise, the Ministry approves "fare ceilings (maximum fare levels)" based on the aggregate cost method. The Ministry must approve basic (ceiling) rates such as price per travel length and price per travel zone, which applies for regular ticket and pass uses. On the other hand, many kinds of other tickets such as serial tickets, group discount tickets, express

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<sup>3</sup> This is an important point to remember when we compare the present situation with the fare approval of the Japan National Railway (JNR) before privatisation, when JNR's fare had to be approved by the Diet (parliament). In case of public (municipal) rail companies, they need the approval of the local council.

<sup>4</sup> Public companies do not pursue commercial profits.

charges, and entrance fees are decided by the railway companies, although the companies have to report to the Ministry.

As we mentioned, the full cost principle is used to calculate fair price (ceiling). Furthermore, two different systems, the cost accumulating method for small private railways and public sector railways, and the rate-base method for major private railways, are used to calculate the rail fare. To help remedy the lack of competition-induced efficiency improvement among railways, the Ministry has introduced a yardstick competition scheme into its evaluation of applications by railway companies for fare increases, a scheme which has been used since the 1970s for the fifteen large private railways (Mizutani, 1997 and 1999).

Formerly, the yardstick method was applied only to the 15 major private railway companies and the TRTA. But from 1997, it has been expanded to include the six JR passenger companies and nine municipal owned underground systems. As a result, the yardstick method is now applied to railways carrying about 95% of all rail passengers in Japan (Okabe 2004). The comparison organized in each of three categories: major private railways, JRs, and underground systems. The new method is still criticized, but we may need a little more time and experience to assess the new method before we change it<sup>5</sup>.

In Japanese public transport provision, the operators decide the level and type of services offered, though there are regulations of basic elements of service standards. In general, a railway operator can determine train schedules. Rail operators are required to publish their time and fare schedules. Every station has information on train schedules and rail users can easily obtain information. This information, especially in case of JRs, is also easily available through commercial booklets such as ‘Timetable (*Jikokuhyo*)’, published by JR and the travel agency JTB<sup>6</sup>.

### **Performance of private railway companies**

The reason for the success of Japanese mass transit providers is likely due to the fact that numerous railway providers are privately owned, decide their own levels and types of services and have broadly diversified their business. Because private railways have to provide and pay for their infrastructure and operating costs, all private rail operators have to admire the market trends and the customers’ demand seriously. As a going concern, they have to be committed in the long-term to the community they serve. Thus, private railway companies have taken initiatives in promoting systematic regional development in and around the areas, which their networks serve, and have developed in close harmony with trackside communities to the

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<sup>5</sup> There have been few attempts to fare increase under the new methods. But many experts claim it is too simplistic to calculate the base costs. In fact, in each cost equation, it only uses a couple of variables. Moreover, the Ministry neglects the difference of service quality among companies.

<sup>6</sup> Some “major” private railway companies also sell their own timetable book.

mutual benefit of both. Depend on passengers for income instead of the government, private railways have had to treat passengers as customers and thus provide extremely reliable, punctual, safe, reasonably fast and convenient service. In addition facing competition from the automobiles, buses as well as other railway companies, private companies had to constantly improve efficiency to survive.

Some researchers attribute the unique success of the Japanese private railways only to the existence of extremely high-density markets with a history of lag of motorization compared to other first world countries, though, nowadays, its level of car ownership are comparable to them. But this view is too simplistic, as we explained. It is and has been the innovative use of diversification strategies that has allowed the private railway companies in Japan to build a stable ridership necessary to not only survive but to thrive. In fact, the privatisation of the government owned and operated Japan National Railway in 1987 was initiated in large part due to the successful examples provided by the private railway companies.

Furthermore, there are many private rail companies, which operate successfully in less populated areas in Japan. Table 4 shows the passenger density and number of profitable private railway companies which have traffic densities of less than 40,000 passenger-kilometres per route-kilometre per day<sup>7</sup>. 16 companies that have traffic densities of 8,000 – 40,000 (passengers) were almost all determined to be profitable. Each ratio of the revenue from rail operation to the cost of rail operation (including depreciation) of these companies was more than 100%, except one company (97%). If the density was more than 2,000, the ratios of all companies were more than 80%.

**Table 4: Passenger density<sup>1)</sup> and number of profitable private railway companies (1995)**

DENSITY <sup>1)</sup>	NUMBER OF COMPANIES	RAIL DIVISION PROFITABILITY				COMPANYS WITH OVERALL OPERATING PROFITS	COMPANYS WITH CURRENT PROFITS (after taxes)
		100% -	95 - 100%	80 – 95%	less than 80%		
20,000 – 40,000	6	5	1	0	0	6	3
8,000 – 20,000	10	10	0	0	0	9	9
4,000 - 8.000	13	8	1	4	0	5	4
2,000 - 4000	13	5	3	5	0	6	4
1,000 - 2,000	21	1	4	5	11	8	5
TOTAL	63	29	9	14	11	34	25

Note: 1) density is defined as the average number of passenger-kilometres per route-kilometre per day.

2) two companies (Sanyo and Kobe Dentetsu) use 1994 data due to effects of the Great Kobe Earthquake.

3) there are seven companies that also provide rail freight services. But only three of them, their freight revenues exceeds passenger revenues; Chichibu (density was 6,300, rail profitability was 84%), Mizushima (4,300, 96%) and Sangi (3,000, 102%). Gakunan (1,400, 81%) has almost same weight of both services.

<sup>7</sup> These companies consist of 1 ‘major’, 2 ‘medium’ and 59 ‘small’ private railways.-

## **SUBSIDY POLICY FOR URBAN RAILWAY**

As we noted, the Japanese basic rule has been that urban railways and other public transport bodies should pay for their own costs, while making exceptions in special cases. Thus, Japanese public transportation is based on the full cost principle, with few subsidies available. Although the national government recognizes the importance of rail system in urban area, they have been reluctant to give public money freely. They might worry the consequences in term of efficiency for society that urban railways being granted subsidies. However, if some areas suffer from insufficient public transportation, then facilities may be obtained through subsidy. However, probably because of this user-pay principle, national government set the subsidy programmes which are only applicable for new line construction, though there are some partial subsidy programmes for other investment projects for specified rail facilities such as, reconstruction of natural disaster, facility modernization (provided to rural railway operators to the equipments in order to enhance the safety and streamline the management), upgrading railway crossing, and anti-earthquake investments etc. There is no subsidy programme for operating accounts<sup>8</sup>.

### **Financing rail infrastructure for private railways**

Because private railways play an important role in Japanese urban transport, urban rail investment has tended to be the domain of the private sector, even after the war. Funding for railway investment is to a large degree obtained through commercial loans. But there is a limited level of government supports available under strict terms.

The Development bank of Japan has offered somewhat low interest loans from 1959 onwards to assist private companies with, for example, grade separation work at railway crossings, line extensions, and platform extension. However, most experts recognize the impacts of this treatment have been nominal.

In 1972, the national government (Ministry of Transport) instituted a program to support the construction of urban private railways, whereby rail lines could be financed by a state-owned entity, called the 'Japan Railway Construction, Transport and Technology Agency' (former Japan Railway Construction Public Corporation). After completion, the rail lines are turned over to the private operator, with the construction cost to be repaid over a period of 25 years, thus this does not represent a grant (investment subsidy), but only a financing arrangement. In accordance with this arrangement, national government set the subsidy program for interest payment. It covers part of the interest to be paid on the funds needed for the construction of line only for this type construction. But, again, most experts recognize the impacts of this

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<sup>8</sup> Until 1996, there was the subsidy scheme to cover part of an operating deficit for eligible smaller private companies, those which operate in rural areas. For JNR reform related quasi-public companies, there are some subsidy.

treatment have been minimal<sup>9</sup>. Anyway, small portion of new lines constructed use this Corporation as most companies choose to finance the construction of new lines by using their own resources.

As Japanese law prohibits cross-subsidisation within private railway companies, both rail and non-rail activities must be profitable in their own right. As a result cross-subsidisation is not feasible. However, private companies have also been very successful in internalising the positive externalities which stem from railway development, as we explained.

### **Construction subsidy programmes for public sector rail**

The Ministry of Transport<sup>10</sup> established the ‘Underground Construction Scheme’ established in 1978, which provides subsidies for the construction of urban underground railway systems by municipal governments and TRTA. National and local government provides a subsidy corresponding to “70%” of eligible construction expenses equally, which corresponds to roughly half the total construction cost<sup>11</sup>. From 1993, public-private mixed (joint-stock) railway companies, which 50% or more the shares are owned by the public sector, also eligible to get this construction subsidy, though until 2001, the amount of subsidy is decreased in proportion to the public share of shares.

In 1972, for the construction of new suburb commuter line, the ‘New-Town Construction Scheme’, which subsidy corresponding to “36%” of eligible construction expenses by national and local government equally, established by the Ministry of Transport<sup>12</sup>. But if the new line constructed by private railways or quasi-private (which 49% or less the shares are owned by the public sector), this subsidy scheme are not applicable,

There is one more subsidy system, which we need explain here<sup>13</sup>. The subsidy programme

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<sup>9</sup> This interest payment assistance scheme subsidy for interest payments in excess of 5 % (at the moment) for investments. In recent years, as market borrowing interest rate has been less than 5 %, this scheme offers almost nothing.

<sup>10</sup> As a result of the administrative reform of the government in January 6, 2001, the Ministry of Land Infrastructure and Transport came into being, as a result of the administrative reform of the government. This new ministry was a consolidation of these former ministries or organizations: the Ministry of Construction, the Ministry of Transport, the Land Planning Agency, the Hokkaido Development Agency, and the Okinawa Development Agency. But to simplify the explanation, we use old name in this section.

<sup>11</sup> Originally, this subsidy system started as the subsidy scheme which covers the part of interest to be paid on the funds for construction in 1962.

<sup>12</sup> From 2002, the subsidy rate decreased to 30%. From 200?, Airport access lines also applicable and only for Narita airport line the subsidy rate increased to 66%.

<sup>13</sup> There have been two more subsidy programmes for the urban rail construction. The one is ‘Interest-free Loan’ (for urban railways). This is provided by the railway subsidy section of JRCTTA to the railway construction section of the JRCTTA for new urban lines and for conversions to double-track lines. But, in fact, the most budgeted of this Interest free loan has spend for the construction of Tsukuba Express line project (Metropolitan Intercity Railway Co.) which will start to operation in August 24, 2005. The rest of budget went a few JR line projects. The other programme is the subsidy for improving the tram running environments. But its

for monorail is established in 1974, and from 1975 it is also applicable for AGT. The programme provides subsidies for the construction of urban monorail or AGT systems by municipal governments and quasi-public (public-private mixed companies which 50% or more the shares are owned by the public sector). The official name of this programme is ‘Monorail Road etc. Construction Scheme’, but in general it calls ‘Infrastructure Construction Scheme’. It covers “infrastructure part” (that is elevated structures under the running tracks) for monorail and AGT and the subsidy cannot exceed 59,9% of construction costs no matter how worthy the project. Officially, there is no room of negotiation to exceed this ceiling value (at the moment, 59.9%); even real infrastructure costs exceed this value.

This programme set by the Ministry of Construction. The ministry had been regulated the rail projects when railway operators provide services by using regular roads (such as tram system). After the lengthy discussion, Monorail and AGT fall under the jurisdiction of the Ministry of Construction<sup>14</sup>. To be precise, the money goes to the road authority (local governments).

### **Irrationality of on-going subsidy programmes**

Thus, most rail subsidy schemes in Japan are for public (or quasi-public) railways. As for subsidies for urban railways, the public sector can get subsidies for construction of new undergrounds, monorail, AGT, or ‘new-town’ lines but the private sector can get only interest payment assistance on new or expanded lines, which has nothing contribution given the low market interest rates. Furthermore, the programmes have the feature of deciding the rail system that each programme targets respectively. Needless to say, these specified subsidy system that established by national government is lack of flexibility. Even after the consolidation of the Ministry of Transport and the Ministry of Construction, there are no real movements to integrate these rather fragmental subsidy programmes, though there have been long discussions on these issues.

**Table 5 Construction Subsidy Programmes and Eligible Operator**

	Schemes	Rail Operator			Road Authority
		Public	Public-private mixed	Private	
Heavy Rail	Underground Construction Scheme	○	○*		
	New-Town Construction Scheme	○	○		
	Interest Payment Assistance (via JRCTTA)		○	○	
Monorail / AGT	Infrastructure Construction Scheme				○
Tram (Light Rail)	Improvement of tram running environments				○

\*) From 1993, public-private mixed railway companies, which 50% or more the shares are owned by the public

amount is rather limited even from Japanese standard.

<sup>14</sup> The monorail/AGT operator also must acquire a license that approved by the Ministry of Transport (now, Railway Division, Ministry of Land Infrastructure and Transport). Ministry of Transport regulate its fares and service standard etc, as the ministry does for ordinal rail.

sector, also eligible to get this construction subsidy, though until 2001, the amount of subsidy is decreased in proportion to the public share of shares.

**Table 6 Truck Space and Subsidy Programme**

		Underground	Elevated	Surface (own right of way)	Surface (mixed traffic)
Rail	Heavy Rail	Underground Construction Scheme	(insufficient)*	(insufficient)	(exceptional)
			New-Town Construction Scheme	New-Town Construction Scheme	
	'Linier Metro'	Underground Construction Scheme	(insufficient)	(insufficient)	◆
Tam and Rubber tyre	Monorail / AGT	(might be possible)**	Infrastructure Construction Scheme	◆	◆
	Tram	(might be possible)	(might be possible)	(insufficient)	<i>Improvement of tram running environments</i>

Note) "Insufficient" means there is only nominal subsidy scheme for this case and "might be possible" means there is a movement to expand the coverage for this case. 'Linier Metro' is the underground which use linier induction motor driven system.

◆: Because of technical reasons, it is impossible to use this space.

\*: There are several cases which cover by the Underground Construction Scheme. But in all cases, Elevated section is a small part of Underground networks.

\*\* : From 2002, Infrastructure Construction Scheme also covers this case, though there is no achievement example.

Thus, to get the funds from the governments to ease the financial problem of the new line construction, the local community have to employ the public (or semi-public) operator; even people know that the public operator has lack of enough management capability especially in terms of efficiency. Moreover, because the big amount of subsidy comes in case of underground, monorail and AGT, the community might choose one of these systems; even the real total costs are expensive comparing with ordinal surface-rail or LRT.

## NEW FINANCING SCHEMES

Given the "self-supporting" principle, the Japanese government set up several special subsidy programmes for special cases, mainly for the new line construction projects, which need massive investment costs. But, these subsidy programmes had been applied the lines provided by public and semi-governmental bodies (quasi-public), but not for private railways which is more efficient operator.

Thus, to get the funds from the governments to lighten the financial problem of the new line construction, the local community have to employ the public (or semi-public) operator; even people know that the public operator has lack of enough management capability especially in terms of efficiency. However, even if a need exists for rail services, for example to accommodate residents of new towns or to make it possible to through operation, it is not easy for the private sector to enter the market. A huge investment for a private railway company would be risky.

There are several attempts to tackle these problems. We will explain here two cases. Both cases use public-private mixed company and rail infrastructure-operation separation.

### **A case of Kobe-Kosoku** <sup>15</sup>

One of the attempts to tackle these problems has been to establish the public-private mixed company to avoid the business risk of the rail service market. The first notable attempt was initiated at the local level.

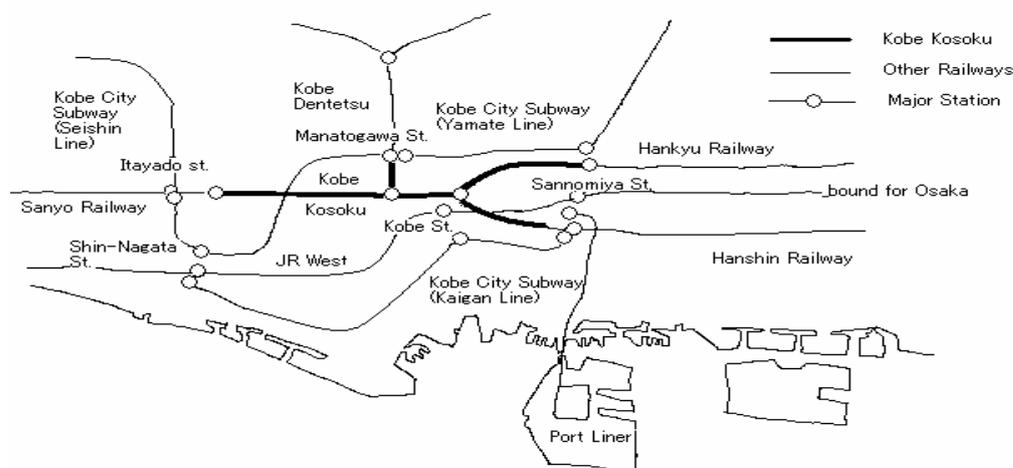
Kobe Rapid Transit Railway (hereafter referred to as “Kobe Kosoku”), which since 1968 has been providing service to connect the networks of four different and separately owned railway companies in the Kobe area. Before the construction of Kobe Kosoku’s tracks, there was no railway line connecting the east-west corridor (Osaka with Himeji), except for the Japan National Railway (JNR) line and a portion of Kobe City’s trams. There was also a lack of efficient service in downtown Kobe, where four large railway companies (Hankyu, Hanshin, Sanyo, and Kobe Dentetsu) were providing rail services but their lines were not connected to each other, much to the inconvenience of Kobe users.

To address these shortcomings in the city’s rail system, Kobe Kosoku was created. Although the original idea to connect east-west corridor proposed by two private companies (Hanshin and Sanyo) in 1920s<sup>16</sup>, official movement for Kobe Kosoku was started in 1946, in the wake of the near destruction of Kobe in World War II bombing. Plans for the construction of Kobe Kosoku were included in a so-called Rebuild Kobe City Master Plan. The company was formally established in October 1958, and began providing rail services ten years later. Simply put, Kobe Kosoku, a company held jointly by the private and public sectors, owns tracks which interconnect four private railway companies and which it lets out to them for use in their rail operations.

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<sup>15</sup> Mizutani and Shoji (2004)

<sup>16</sup> In fact, both companies applied the license to extend the line to Minatagomawa (midpoint of both terminals) in 1924 and city council approved in 1926.



**Figure 1. Kobe Kosoku and Major Railways in Kobe**

Source: Mizutani and Shoji (2004)

The three types of rail licenses described before did not come into existence until 1987, when the Japan National Railway was privatised and the Railway Enterprise Law enacted. Before the three types of licenses were created, all railways held the same license and were expected essentially to be both infrastructure-owning and rail service-providing companies. But because of the shortness of the lines (total network length is 7.6km) and the situation, it was judged irrational to establish the new integrated rail company which have own tracks, rail stocks, drivers and depot, even if the city established the new municipal underground company which is eligible to get construction subsidy.

Thus, from the beginning Kobe Kosoku held its own tracks, though it did not own its own trains. Kobe Kosoku “contracted out” its train service to the four older rail companies. The ministry of Transport permitted this arrangement as a special case. Compared with underground systems in Japan, Kobe Kosoku has been a for-profit organization, because the majority of shareholders (60%) are private companies. While subway systems consume government subsidies, Kobe Kosoku began issuing dividends to its shareholders as early as 1978.

Kobe Kosoku is a unique company in threefold. First, the stock of Kobe Kosoku is jointly held by the original four railway companies (40%) whose services it connected, by the Kobe city government (40%), and by other private companies (20%)<sup>17</sup>. Although the capital stock covers a small part of total investment costs<sup>18</sup>, investment from the city facilitate the financing of the construction of the facility. Furthermore, because Kobe Kosoku has been partly held by its operation companies, so that the opinions of operation companies are reflected in railway decisions, and most involved usually behave with mutual benefit in mind. When Kobe Kosoku makes important decisions about investment plans or the coordination of

<sup>17</sup> In precisely, the total amounts of the stocks of four private railways exceed by 40 stocks which is 0.025% of the total stocks..

<sup>18</sup> National government set the guidance to the amount of capital stock for new line: 10% of rail construction costs at that time (later, it became to 20%).

train scheduling, it can freely take into account the opinions of its operation companies, because they are partial owners.

Secondly, Kobe Kosoku is an infrastructure-owning company. But, compared with a typical infrastructure company whose relations with the rail users are presumably made unnecessary by the presence of the service-providing company, Kobe Kosoku has a direct relationship with the consumer (passengers). This means that Kobe Kosoku shares the revenue risk. While Kobe Kosoku appears to be an integrated railway company, it is in actuality purchasing rail operation services from operation companies by contract.

Finally, to avoid the business risk of the initial investment in rail infrastructure, Kobe Kosoku obtained money through a kind of value capture techniques. Four private railways, Kobe Kosoku and City of Kobe made agreement to pay “connection benefit fee” from 1968 to 1973. The amount of this fee decided by business negotiation. Thus four private railways transfer part of the possible financial gain arising from direct rail connection. The total amount of 6 years of four rail companies is 3 billion yen. Therefore Kobe Kosoku got in average 500 million yen annually. Roughly speaking, 500 million yen meant 24.7million passengers in 1970 average fare revenue and this was almost 30% of annual passengers.

### **A new scheme for private railway extension**

The national government established the class 3 license for infrastructure-only company. One of the intentions of this new system was to contribute to initiate new rail service in urban areas. In fact, the private and public sector have recently started to establish new rail track companies to enter into new markets, leaving the operations to the private sector. For example, Kintetsu applied for this kind of rail license for a new town (Keihanna new town in the suburbs of Osaka and Kyoto). Not only this new established infrastructure-providing company got investment from public sector, it also gets public funds via ‘New-Town construction scheme’.

From 1993, public-private mixed railway companies, which 50% or more the shares are owned by the public sector, also eligible to get ‘underground construction subsidy scheme’, but the amount of subsidy is decreased in proportion to the public share of shares. However in 2001, the national government changed this rule. Hereafter, the public-private mixed company also gets full subsidy as public company. There are two lines that are now under construction to utilise this scheme and both situate in Osaka area. Keihan use this scheme for a new line, which run through Nakanoshima (downtown area of Osaka and its western part is now under re-development stage). Another case is Hanshin for an extension to Namba (it allow through operation between Hanshin and Kintetsu). Both lines will be opened in 2009.

These two construction projects have pretty much similar characteristics and procedure. The stock of the infrastructure company is jointly held by the private rail company (about 33.35%),

which will become Class 2 operator, by the Osaka city government (33.33%), by the Osaka prefecture government (16.67%), and by other private companies (about 16.65%). So, although the stock is jointly held by the public sector and the private sector equally, the biggest share owned by the private railway company. Then the CEO of the infrastructure company comes from the private rail company.

Table 7 shows the financing scheme of this new arrangement. Before the construction started, the private railway company (Class 2), local governments and the national governments estimated the total amount of truck construction costs of the new line and reached the agreement. Then, total costs are divided two categories: the eligible costs for underground construction subsidy scheme (about 95-97%) and the not-eligible costs for the scheme (about 3-5%)<sup>19</sup>. In case of the Keihan Nakanoshima new line, the former cost is 144 billion Yen (about 1,050 million Euro) and the latter is 6 billion Yen (about 40 million Euro). Capitol stock covers 20% of the costs of each of both categories. Under the underground construction scheme the national governments and local governments covers in total 53.2% of the eligible costs for the scheme. Rest of this costs (26.8%) obtained through loans. Concerning the latter category 80% obtains through loans.

**Table 7. Financing Scheme for Truck Construction (new Scheme)**

Total Construction Costs					
Eligible for Subsidy		100%	Not eligible for Subsidy		100%
Capital Stock	Public Sector	10%	Capital Stock	Public Sector	10%
	Private Sector	10%		Private Sector	10%
Subsidy	National Government	25.2%*	Self-Financing	Loan	80%
	Local Governments	28.0%			
Self-Financing	Loan	26.8%			

Note) In general, total amount of 'not eligible for subsidy' is about 3-5%. Total construction costs dose not includes rolling stocks, related investments on existing section, and other related expenses.

\* In theory, the share of national government is 28.0% (=80%\*0.7\*0.5). But, because of the fiscal reason, national government decreased 10% of its portion (25.2=28.0\*0.9).

The costs of related investments on existing section, procurements of new rolling stocks and other related expenses (such as public relations costs, system development costs for automatic fare collecting system and sign system costs) are not included in the total truck construction costs. The private railway company pays all these costs.

## POSSIBLE LESSONS FROM JAPANESE EXPERIENCES

Private railway companies have the reputation that they have made vigorous efforts to

<sup>19</sup> This costs include interest payments during the construction period and some other miscellaneous expenses

increase passengers, expand automation in the rail business, and introduce other efficiency measures in Japan. On the other hand, even the publicly owned underground systems are eligible to get the subsidisation for construction and, in most cities, get the local 'subsidy' for operation accounts<sup>20</sup>, they experience political intervention at any level of decision-makings<sup>21</sup> and accumulate operating deficits in most cases, though the national government also apply the full-cost principle.

While private railway companies are financially independent, they have full responsibility for their decisions regarding networks, operating patterns, schedules and fares. In short, they are autonomous commercial entities. Under the self-sufficiency principle for local public transportation of the national government, there have been few changes in the rules of the games. Private railways are permitted to develop and operate on their own, given the pre-defined principle and some regulations. Thus they can allow having a long-term, commitment to the community it serves. In fact, many people argued that private railways have succeeded to develop in close harmony with trackside communication to the mutual benefits of both. These long-term relationships via all kind of businesses contribute to be able to effectively design and improve their services.

Compare with public railway companies, the urban private railway companies in Japan are autonomous organizations which will have full responsibility to provide public transportation service to the public under the commercial principle. Japanese people enjoy the highly reliable, punctual and comfortable rail services without tax burden. Private railways have achieved a high social status by offering not only impeccable transport services but also by diversifying and bringing forth quality amenities, products and services in their region.

However, because of the commercial principle, private railway companies tend to reluctant to expand their network in urban area, given the huge costs and/or un-profitability. There are cases that the rail lines are closed, though there are many private rail companies which operate successfully in less populated areas in Japan. Even un-remunerative means the market deny the economic value of the services, it might happen that its social benefits are well over its costs. In fact, given the "self-supporting" principle, the Japanese national government set up several special subsidy programmes for special cases, mainly for the new line construction projects, which need massive investment costs. But, these subsidy programmes had been applied the lines provided by public and semi-governmental bodies (quasi-public), but not for private railways.

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<sup>20</sup> As we noted, there are no national subsidy scheme for operation. Under the Japanese local government system, the power and financing ability is rather limited and are controlled strictly by the national government. One of the ways of subsidy is the 'concessionary fares rebate for elderly and handicapped people'. So it might be better to say fare compensation. However, the amount of rebate tends to have little relation to the actual number of elderly and handicapped passengers.

<sup>21</sup> It is true that no private railway welcomes intervention from the authorities. For example, Hankyu, which is a major private railways based in Osaka, turned down a subsidy from the government to rebuild its rail track damaged by the Great Kobe Earthquake in 1995. Hankyu chose to finance reconstruction of its rail track itself in order to avoid possible governmental strings attached to such a subsidy.

For people who live in the countries which has the mobility first principle, Japanese arrangements for rail construction seems to be somewhat beside point. However, these are very important arrangements to utilize private railway companies. It allows private railways to benefit indirectly from subsidisation. To prevent to have negative effects on their efficient management system, we need to check the various points. From our observation, we might be able to present some important points or keywords.

The idea of infrastructure-operation separation might create conflict between the two functional sectors. In order to avoid the conflict between operators and infrastructure, shares of Kobe Kosoku are held by operation companies so that the opinions of operation companies are reflected in railway decisions, and most involved usually behave with mutual benefit in mind.

Furthermore, Kobe Kosoku is not simply a rail infrastructure provider but is rather more like an integrated railway company, which purchases rail operations by contract. This means that Kobe Kosoku cannot determine its fare revenues alone but must work in cooperation with its train operating companies, quite unlike a typical infrastructure company, which charges infrastructure fees regardless of the conditions of fare revenues. Thus, Kobe Kosoku shares the revenue risk with operation companies.

However, the case of Kobe Kosoku has disadvantages, besides Kobe Kosoku was not eligible for the national subsidy scheme. Firstly, even if Kobe Kosoku is specializing in mainly maintaining infrastructure, the maintenance cost is no different from the costs of integrated systems. Our econometric calculation shows this result (Mizutani and Shoji 2004). In fact, some railway experts claimed that the number of staffs in electricity maintenance department seems to be too many<sup>22</sup>.

There is the problem that the company might be lack of ability to make large investments. In the event of Great Kobe Earthquake, Kobe Kosoku found itself with woefully few resources to deal with the crisis. It had been focusing on track maintenance and traffic controlling, whereas in the aftermath of the earthquake, a huge labour force was suddenly required for rebuilding. Same kind anxious might be happen for financing.

The new scheme for Keihan and Hanshin made progress on these points. The underground construction subsidisation programme is applicable for this scheme. The public sector involve mainly in funding the construction phase and the construction. Although the stock is jointly held by the public sector and the private sector equally, the biggest share owned by the private railway company (Class 2 operator at this new section, which run through operation from its existing line). Then the CEO of the infrastructure company comes from the private railway company. The private railway company has incentive to streamlize the construction costs and

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<sup>22</sup> We heard this assertion from Mr Nomura (Hankyu) and Mr Sugiura (Hanshin) independently.

keeps the last to say on the management issues of the infrastructure company. In any case, the Class 2 company should redeem the total construction costs to the infrastructure under the scheme.

Thus the scheme entrusts to private business as much as possible and minimise the public intervention, which might increase the construction costs. The scheme also take care of to stop conflicts between the infrastructure company and the operation company. And the resource problems of the infrastructure company can be avoided.

These new arrangements might be possible to extend the other cases of investments, such as a devastating earthquake exceeding the risk levels normally envisaged by private companies, a universal design instruments, and a new line construction. Concerning the operating subsidy, this is not an easy question to answer, though most Japanese think un-remunerative services might mean that the community are not support.

Finally, as we noted before, Japanese systems meets another type of problems. The national programmes have the feature of deciding the rail system (and ownerships) that each programme targets respectively. Needless to say, these specified subsidy system is lack of flexibility. If the national government transfers more power to local governments, it might contribute to overcome the problems. The case of Kobe Kosoku gives a good example. However, we should mind that the local governments tend to adopt the plan to extend their own underground lines instead of utilising the existing private railway lines. In fact, partly because the Japanese subsidisation system, we have several cases.

The Japanese case provides us with a role model that may lead to increase rational private provision of public transport services. To utilize the private efficient management ability, we need to construct the well-considered and structured arrangements. From our discussion, we think following keywords are essential: autonomy, entrust, mutual benefits, long time commitment, and the 'self-supporting' principle.

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