



Looking Beyond Europe with a Special Focus on Japan

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(Citation)

神戸大学経営学研究科 Discussion paper, 2014・24

(Issue Date)

2014-09

(Resource Type)

technical report

(Version)

Version of Record

(URL)

<https://hdl.handle.net/20.500.14094/81008576>



Graduate School of
Business Administration

KOBE
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ROKKO KOBE JAPAN

2014-24

Looking Beyond with a Special Focus on Japan

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Discussion Paper Series

Looking Beyond Europe with a Special Focus on Japan

Fumitoshi Mizutani

1 INTRODUCTION

This chapter summarizes regulatory structure and reforms in the rail industry in non-European countries. I have selected four regions—East Asia, Oceania, North America, and the former socialist countries—with Japan, Australia, the United States and Russia chosen for each region, respectively. Although the structure of the rail industry in all four countries will be summarized, this chapter focuses on Japan because its rail regulatory structure is quite different from that of European countries.

Because of its differences from others, the experience of regulatory reforms in Japan could provide useful lessons for policy makers and practitioners in Europe. One distinctive feature of regulation in Japan is its relative moderation. Second, competition policy is different: instead of direct competition for rail track, a yardstick regulation (or competition) scheme is applied to the rail industry in Japan, resulting in indirect competition (i.e. competition among different rail service markets). Third, most rail operators are privately owned in Japan. Fourth, as for structure, rail operation and infrastructure are integrated. Of course, there are cases in Japan of vertical separation, but the purpose of vertical separation in these cases is quite different from that in Europe. Finally, in Japan passenger services are dominant, and freight services are more limited than in Europe.

This chapter consists of the following five sections. In the second section, I will briefly describe regulation and regulatory reforms, market structure and competition policy in the four chosen countries above mentioned. After the second section, by focusing on Japan, I will discuss regulation policy and competition policy. Beginning with the third section, I will explain the situation in Japan, focusing on entry and fare regulations. The fourth section will cover regulatory reforms in Japan since 1987. In this section, after a description of major regulatory changes, there will be a summary of the 2004 privatization of Eidan, now called Tokyo Metro. In the fifth section, competition policy in Japan will be discussed. The yardstick regulation scheme as a competition tool will be explained and its effects discussed. The sixth section will contain an explanation of Japanese-style unbundling policy. The four types of unbundling will be described, and the purposes and characteristics of each type will be explained. The seventh section will discuss possible lessons for European railways based on the results of the previous sections. The last section summarizes the points made in this chapter.

2 REGULATORY REFORMS IN MAJOR NON-EUROPEAN COUNTRIES

In this section, I will describe the selected four countries' characteristics relative to regulatory policies, focusing especially on entry, the ownership of the organization, and vertical structure. Selected countries are Australia, the United States, Russia and Japan.

Although the population of Australia is small, rail networks are quite extensive because of Australia's huge land area. The main rail services are for freight transport. Regulatory reforms in Australia began in 1998, when the Australian National Railway commission (AN) was privatized and divided into several freight service companies. At this time, vertical

separation was also adopted and the Australian Rail Track Corporation (ARTC) was established as the infrastructure manager (e.g., Department of Infrastructure and Regional Development (2014), Owens (2004)). Through the regulatory reform of the former state railways and the establishment of ARTC, free access in the interstate rail network was accomplished.

This institutional reform was enacted in the interstate rail system in Australia, where three organizational forms exist, the first of which is vertical separation. As mentioned above, the ARTC holds and manages the interstate rail network and allocates track usage for operating companies. Typical examples of operating companies are Great Southern Railway (GSR) for passenger service and Pacific National (PN) for freight service. The second form is the vertical separation of urban railways, an example being the tram and train network of metropolitan Melbourne, formerly owned by the State Government of Victoria and taken over by Yarra Tram on April 1, 2004. On November 30, 2009, Keolis/Downer acquired the Yarra Trams franchise for a period of 8 years. The third form is the vertically integrated intrastate railway. For example, in Queensland, Queensland Rail handles both rail operation (i.e. passenger and freight services) and infrastructure management. The Queensland Rail is a 100% publicly owned corporation (i.e., by Queensland state) and three different brand names are used for rail services (Citytrain for urban passenger service, Traveltrain for intercity passenger service, and QR National for freight service).

In the United States, as in Japan, instead of unbundling, deregulating railway tariffs and services is preferred. Because of the huge national land area, rail passenger transport plays a very limited role, being concentrated in urban areas or main corridors only. Air transportation for long distance transport and autos for short distance transport are the dominant modes. Amtrak, which was established in 1971, is an interstate passenger rail company and a public corporation held by the Federal government. Amtrak mostly does not hold own-track but borrows tracks held by freight railways. The share of passenger transport by Amtrak is very limited. In contrast to the situation in Japan, rail freight transport plays an important role in the United States. Although there are a considerable number of freight railways in the U.S., seven freight railway companies are called "Class I railroad." These freight railways are all privately owned and vertically integrated. Circumstances in many European countries fall somewhere between those in Japan and the U. S. The difference between Japan and the U.S is that the situations for passenger and freight service are reversed.

Although Russia has an enormous land area, its population is similar in size to Japan's. Details of the restructuring of Russian Railways are discussed in Pittman (2013), Saito (2011) and Iida (2011). According to Russian Railway (2014) and Iida (2011), Russia's railway was formerly state-owned, but on May 18, 2001, a Railway Structural Reform Program was instituted by the Russian Government based on Decree No. 384. The reform plan was divided into three stages, to be completed in 2010. The most important point of structural reform in Russia, according to Russian Railway (2014), was "*to preserve the unity of the railway network and separate the functions of state regulation from operational management.*" However, there are certain features characterizing the three stages. In the first stage (2001-2003), a 100% state owned railway company (Russian Railways, RR) was established and the company was separated from regulatory and policy making government bodies. A joint stock company organization with 100% of its shares held by the national government, RR was instituted as a result of the reform of the Ministry of Railways in 2003. In the second stage (2003-2005), specialized subsidiaries for container shipments, freight deliveries, maintenance of rolling stock and so on were created under RR. At the same time, the new entry of other private railways and freight railways was promoted. In the third stage (2006-2010), the subsidiary companies were privatized and freight railways shifted mainly to the private sector.

In general, these serial reforms of the state railways are evaluated more highly than reforms in other public utility industries in Russia, such as electric power and gas. Certain positive evaluations note that the organization of the Russian Railways has been streamlined

and that competition in service quality and price has improved in freight services due to new entry (Saito, 2011). However, critics contend that Russian Railways is still dominant and that fair competition has not been made possible, with notable evidence being a lack of progress for new entrants into the passenger service market.

Finally, as for Japan, the main railway services consist of passenger transport. In a situation opposite to that in the United States, freight rail services were once vital in Japan but have declined due to intense competition with automobile and maritime transport. Extensive regulatory reform in Japan occurred in 1987 when the Japan National Railways was privatized and divided into six passenger JR companies and one nationwide freight JR company. Since then, despite two important regulatory reforms having been enacted, the organizational structure in the rail industry has remained unchanged. As for structure, vertical integration is common in Japan. Most rail operators are privately owned. There is no competition for rail track among rail operators because the same company handles both infrastructure and operation. However, the yardstick regulation (competition) scheme, which is considered indirect competition, is applied to the rail industry in order to avoid efficiency loss due to the lack of direct competition.

Based upon the above-mentioned information, the current situation of nationwide (or interstate) railways in these four countries is summarized in Table 1.

Table 1 The Current Situation of Nationwide Railways in Selected Non-European Countries

Country		Australia	United States	Russia	Japan
Population ^(a) (thousand)		22,324	311,588	142,961	127,799
Rail passenger-km ^(a) (million)		16,390	10,570	139,742	390,973
Rail tonne-km ^(a) (million)		264,469	2,524,666	2,127,835	19,417
Total route-km ^(b)		38,445	224,792	87,157	27,182
Entry regulation ^(c)	Passenger	Free entry (upon paying access fees)	Entry franchised (single firm)	Entry franchised (several firms)	Entry franchised (6 firms)
	Freight	Free entry (upon paying access fees)	Free entry (upon paying access fees)	Entry franchised (several firms)	Entry franchised (single firm)
Ownership of organization ^(c)	Infrastructure	Government ownership (ATRC)	Private ownership	Government ownership	Operator (JRs) ownership
	Passenger	Private ownership (GSR)	Government ownership (Amtrak)	Government ownership (RR)	3 private & 3 government ownership
	Freight	Private ownership (PN etc.)	Private ownership	Government ownership (RR)	Government ownership
Vertical Separation ^(c)	Type	Legal separation	No separation	Accounting separation	No separation

[Source]:

(a) *International Transport Forum (2014)*

(b) *Central Intelligence Agency (2014)*

[Note]:

(c) *This information is summarized by the author based on several sources such as OECD (2014), Department of Infrastructure and Regional Development (2014), Saito (2011), and Pittman (2011).*

It is worth noting that it is difficult to convey the entire situation in one table. For example, Japan has many private railways, with considerable variation in their structure. In Australia, regulation and vertical structure vary by state. In the U.S., urban rapid railways are quite different from Class I railroads in terms of ownership. However, in a summary of these countries' characteristics, the following points stand out.

Australia is clearly following reform of the type found in the UK or Sweden. Regulatory reform is intended to create more competition and to separate rail operation and infrastructure. However, compared with freight services, passenger services are not well designed to achieve their goal. The history of Russia's reform is too short to allow definitive statements to be made, but it does follow a more European type of reform (i.e. vertical separation and the promotion of competition in the market). The U.S. and Japan show significant differences from Europe. Although passenger service and freight service in both countries are perfectly opposite, both countries are similar in terms of having mainly vertically integrated rail systems and privately owned operators in major services. Clearly, these countries are on a different track from Europe. Although Europe promotes competition, Japan, with its yardstick competition (or benchmarking), has a different perspective.

Therefore, to conclude this section, in terms of vertical structure, competition, geographic size and mix of passenger and freight transport, Japan could present a considerable contrast to the European countries selected for comparison. Therefore, beginning in the next section, I will provide details about rail service conditions and regulations in Japan.

3 MARKET STRUCTURE, REGULATORS AND REGULATION IN JAPAN

Beginning with this section, I would like to focus on the Japanese rail industry. The second section describes market structure and the regulatory body. In this section, I will also explain privatization policies already enacted for both the Japan National Railways and the Tokyo Metro.

3.1 Market Structure

Rail transportation in Japan continues to play an important role in passenger transport, whereas rail transport for freight services remains a small proportion of the freight market. It can be seen from Table 2, which shows a comparison of rail share among selected industrialized countries, that each country has a quite different structure. Freight transportation by rail in the US is very important, but rail passenger transportation is limited to a very small proportion of the market. Because of the huge US land area, air transportation for long distance transportation and car transportation for intra-urban travel are the dominant modes. On the other hand, conditions in European countries fall somewhere between those in Japan and the US. For passenger rail transportation, the share is between 7 and 11% in European countries, much larger than in the US but only 1/4 to 1/3 of Japan's. The share of freight rail transportation is between 9 and 16%, more than twice that of Japan.

As explained above, although auto transportation has been increasing in Japan as in other countries, the share of rail transportation remains very high, due to heavy use in large metropolitan areas such as Tokyo, Osaka, and Nagoya. Table 3 shows a comparison between rail transportation and auto transportation. As this table shows, railways remain the dominant transportation mode in large metropolitan areas.

Although Japanese passenger railways are financially healthy and performing well in metropolitan areas, it is worth noting that railways in rural areas and freight rail transportation are less prevalent.

There is a multitude of rail operators in Japan. In Japan the definition of railway

includes operators of heavy, light rail, monorails, automated guideway transit and cable cars. According to the Ministry of Land, Infrastructure and Transport (2013), as of July 1, 2013, there were 205 rail operators. Among these various rail organizations, there were 166 passenger heavy rail operators and 12 freight rail operators.

Table 2 A Comparison of Rail Share in 2009

Selected Countries		Japan	UK	Germany	France	USA
Passenger transport	Person-km (billion)	393.9	61.0	82.2	99.2	58.3
	%	35.7	7.8	7.4	11.2	1.0
Freight transport	Ton-km (billion)	20.6	19.1	95.8	32.1	2,546.1
	%	4.0	8.9	16.4	9.2	36.8

[Note]: These statistics were taken from a data source of the Rail Fact Book 2013 by the Ministry of Land, Infrastructure and Transport (2013, pp.18-21).

Table 3 The Transport Situation in Japan in 2009

Metropolitan Areas	Tokyo		Osaka		Nagoya	
Transportation mode	Rail	Auto	Rail	Auto	Rail	Auto
Number of passengers transported (million)	20,158	18,585	4,494	4,739	1,102	4,014
Share of transport in terms of passenger (million)	59.7	40.3	48.7	51.3	21.5	78.5

[Note]: These statistics were taken from a data source of the Ministry of Land, Infrastructure and Transport (2013, pp.24-25).

Although a more detailed definition of ownership in the Japanese railways industry can be found in Mizutani (2012), in general, most rail operators are privately owned. The best-known railways are the 15 large private operators providing service in large metropolitan areas such as Tokyo and Osaka.

Publicly owned railways are limited to the 11 operators run by the transportation bureaus of such large cities as Tokyo, Osaka, Nagoya and so on. Of these operators, 9 are

subway systems in the largest cities, such as Tokyo, Osaka, and Nagoya.

The JR companies are rather complicated. Six JR passenger companies and 1 freight company were generated when the former Japan National Railway was privatized and divided in 1987. Among the 6 passenger JR companies, the 3 major JR companies (JR East, JR Central and JR West) have been fully privatized. The 3 smaller JR companies (JR Hokkaido, JR Shikoku and JR Kyushu) and 1 Freight JR company have not yet been fully privatized, as shares of these companies are still held by the national government. The Shinkansen system, popularly known as the bullet train, is run by the JR companies.

3.2 Regulators

An important feature of the rail industry in Japan is that regulators and policy makers are one and the same. Whereas in many European countries, rail regulators are separate from ministries involved in policy making (see for example, Nash (2008)), in Japan the government itself both creates and regulates policy, one reason being that competition in the rail market is not fully open. The market itself is tightly limited to existing incumbent companies, and the idea of pursuing fair judgment from disinterested regulators has not taken hold.

Under these circumstances, the Ministry of Land, Infrastructure and Transportation has assumed the role of regulator, making and enforcing regulations as well as formulating policy in the rail industry. Further details will appear in the following section, but this regulator is responsible for permitting new entrants into the rail industry and approving the ceiling price for local rail service. Furthermore, the Ministry of Land, Infrastructure and Transportation applies yardstick regulation to the rail service industry by collecting the results of several performance evaluation measures and determining the standard costs of each operator.

3.3 Entry Regulations

While vertical integration is the norm in the rail industry in Japan, there are some railways that are vertically separated. In Japan, railway organizations are classified into three categories:

- Class 1: Rail organizations that provide passenger and/or freight services while holding their own rail infrastructure (i.e. integrated rail companies);
- Class 2: Rail organizations that provide passenger and/or freight services using another organization's rail infrastructure (i.e. rail operation companies); and
- Class 3: Rail organizations that own infrastructure and rent it to a class 2 organization (i.e. rail infrastructure companies).

Most railway organizations in Japan are class 1 railways. Examples of class 1 railways are the 6 passenger JR companies and the 15 largest private railways and public subway systems. On the other hand, there are only a few class 2 and class 3 railways. A typical example of a class 2 enterprise is JR Freight, which provides freight service by borrowing the rail tracks of the 6 JR passenger companies. An example of a class 3 enterprise is Kobe Rapid Transit Railway (*Kobe Kosoku*), a rail track holding company connecting points in downtown Kobe. Details of Kobe Rapid Transit Railway can be found in Mizutani and Shoji (2004). Although the vertical separation policy in Japan is quite different from that in Europe, it is worth noting that cases of vertical separation are gradually growing more common in rural areas in Japan. I will explain these cases in a different section.

As for entry and exit regulations, in order to enter the market, it is necessary for a rail organization to secure permission from the government. The only exit regulation is that operators notify the government one year prior to terminating rail services.

Entry regulation: Permission system (individual operator basis)

Exit regulation: Report in advance (1 year prior)

For entry into the market before 2000, it was necessary for a rail organization to have a license, but the system has changed and is now based on acquiring permission. Although the duration of permission is not specified by law, operators may continue operating as long as there are no serious management or safety concerns.

Exit regulations were also lightened after deregulation. Former regulation stipulated that operators obtain permission to exit the market. However, to quell any concern that rail services in rural areas might be too easily abandoned, a regional council system was also instituted, whereby if the proposed termination of rail services is deemed unreasonable, then the council has the option of petitioning the regulator to contest the operator's intent to terminate service.

3.4 Fare Regulation

Rail fare in Japan is regulated. The most important feature of rail fare is that the full cost principle has generally been applied in the rail industry, whereby it is expected that the demand for rail services is high enough for fare revenues to cover the costs of services. The full cost principle, however, can no longer be universally justified, as fares often no longer cover costs, especially in rural or small urban areas.

As for price level, approval by and reporting to the regulator are required. The ceiling price of the rail fare of each rail operator is set based on the cost structure of each operator, and this must be approved by the national government. If the operator is faced with conditions making it necessary to change the ceiling price, then the operator must gain approval from the regulator. In cases where the fare change falls under the ceiling price, it is not necessary for the rail operator to seek approval; it need only report the change to the regulator.

The third important point regarding fare regulation is that yardstick regulation is applied to the rail industry. In the rail industry in Japan, there is no direct competition for rail track, so that many rail service companies, especially in large metropolitan areas, might tend to become regional monopolies due to the lack of competitive transportation modes. In order to avoid inefficient or monopolistic rail operation management, the regulator applies yardstick regulation. Details of yardstick regulation can be found in articles such as Okabe (2004) and Mizutani (2012), but its essence is that the regulator evaluates the performance of a rail operator by using common measures such as average cost. If an operator's performance is inferior to the standard level, then as a penalty the regulator orders the operator to reduce costs. Since 1997, yardstick regulation has been applied to three railway groups: the JR passenger companies, 15 large private railways, and 10 subway systems. The results of empirical analysis show that yardstick regulation is effective (see Mizutani (1997), Mizutani et al. (2009)).

Last, there are no specific criteria for the assessment of rail track fees. However, as for JR Freight, the avoidable cost principle is used. In general, because rail track fees are set up to cover providers' costs, the regulator assesses whether or not the cost is reasonable.

3.5 Other Regulations

One important characteristic of private railways in Japan is that many of them are also engaged in non-rail business such as real estate development, retailing, tourism and others, for the purposes of enjoying scope economies, increasing rail ridership, acquiring external economies by land development, and so on (see for example, Saito (1993), Shoji (2001) and Mizutani (2006, 2008)).

Some railway analysts might argue that the good financial performance of private

railways in Japan could be the result of cross-subsidization from their non-rail business divisions to their railway division, but this view fails to consider that rail accounting regulations strictly prohibit a railway company from allocating rail and non-rail cost at its own discretion. Railway companies are required to avoid intentional cross-subsidy strategies like charging high rail fares or transferring costs to and from non-rail services.

4 REGULATORY REFORMS IN JAPAN

This section describes regulatory reforms of the rail industry in Japan since 1987. Reforms of the rail industry were carried out three times. After explaining the main features of these reforms, I will explain the privatization policies of the Tokyo Metro, which was privatized after the privatization of the Japan National Railways.

4.1 A Brief History of Regulatory Reforms Since 1987

Since the massive regulatory reform in the rail industry that took place in 1987, two other major regulatory reforms have been undertaken. Although the details of these reforms are explained in Mizutani (2012), the features of these regulatory reforms are summarized as follows.

The first massive reform was enacted in 1987. In this year, the Japan National Railway (JNR) was privatized and separated into 6 regional passenger railways (i.e. JR East, JR Central, JR West, JR Hokkaido, JR Shikoku, and JR Kyushu) and a nationwide freight railway (JR Freight). The main laws describing entry and exit regulations, price regulations and so on in the rail industry were unified into one main law called the Railway Business Law (*Tetsudo Jigyo-ho*). This law defines three categories of railway license: class 1 (for both rail operation and infrastructure), class 2 (for rail operation only), and class 3 (for infrastructure only).

The second reform was in 1997, when both the ceiling price system and yardstick regulation were introduced. The ceiling price in Japan is different from the general ceiling price under the price-cap regulation, which is obtained by the deflator of the consumer price index (CPI). As mentioned before, the ceiling price is obtained as each individual railway company's full cost level and must be approved by the regulator. As for yardstick regulation, information about each individual rail operator (i.e. the average cost, efficiency improvement) is evaluated and used for fare revision evaluation.

Third, extensive reform of the Railway Business Law was enacted in 2000. Entry regulations changed from a licensing to a permission system. As the permission system theoretically grants potential entrance to any organization, this change can be considered as liberalization of the rail market. The second point is that stipulations controlling the balance between supply and demand were abolished. Before 2000, the demand and supply situation of rail services was heavily considered when any potential new entrant appeared. The third point is that exit regulations were also lightened after deregulation. Last, fare was deregulated. Fare approval became necessary only when rail fare exceeded the ceiling price.

4.2 Privatization

As for privatization in the rail industry in Japan, the privatization of JNR is the most famous. The characteristics of the Japanese approach to state railway restructuring can be summarized in the following seven points: (i) horizontal separation (or regional subdivision); (ii) functional separation (or passenger-freight distinction); (iii) vertical integration (or operation and infrastructure integration); (iv) lump-sum subsidies for low density JRs; (v) establishment of an

intermediary institution; (vi) allowance of non-rail service; and (vii) yardstick regulation.¹ As information about the privatization of JNR is widely available, I would like to focus on the privatization of the “Teito Rapid Transit Authority” (hereafter “Eidan”) as a current case in the rail industry in Japan.

The privatization of Eidan became official on April 1, 2004, when the new corporation became known as “Tokyo Metro.” Tokyo Metro’s current profile is summarized in Table 4.

Table 4 The Current Profile of Tokyo Metro

Corporate Figures	Total Employees	8,692 (as of March 31, 2013) ^(a)
	Capital Stock	58.1 billion yen ^(a)
	Major Shareholders	53.4% (National Government), 46.6% (Tokyo Metropolitan Government) ^(a)
	Total Sales	343.6 billion yen (as of FY2012) ^(a)
Rail Transportation Figures	Route-km	195.1 km ^(b)
	Number of Lines	9 lines ^(c)
	Number of Stations	179 ^(c)
	Rolling Stock	2,773 ^(c)
	Vehicle-km	283,871 thousand car-km ^(b)
	Number of Passengers	2,278 million persons ^(b)
		18.4 billion passenger-km ^(b)
	Operating Revenues	333,215 million yen ^(b)
	Operating Costs	255,046 million yen ^(b)
	Revenue/Cost Ratio	1.31 ⁽¹⁾

[Source]:

(a) *Tokyo Metro (2014)*.

(b) *Ministry of Land, Infrastructure, Transport and Tourism (2013)*

(c) *Ministry of Land, Infrastructure, Transport and Tourism (2014)*

[Note]:

This is obtained by dividing operating revenues by operating costs.

Since 1941, when Eidan was established to build a subway network and provide subway services in downtown Tokyo, it has become the essential transportation mode in Tokyo. It was privatized as part of reforms of special public corporations under Prime Minister Koizumi, whose cabinet devised the “Reorganization Plan of Special Public Corporations” in December 2001. Among other public corporations, Eidan was slated to be changed to a special corporation as one step toward full privatization around 2004. In December 2002, the Tokyo Metro Corporation Law was promulgated and the Tokyo Metro Corporation founded.

As the shares of the new corporation are still held by the public sector, strictly speaking the Tokyo Metro Corporation has not yet been privatized, so that it is more appropriate to refer to what has occurred so far not as “privatization” but as “corporatization.” Whatever the process is called, however, it is clear that since the first steps toward privatization have been taken, corporate management has become much more free. Morichi (2003) describes the following changes after the initial steps toward Eidan’s privatization. First, non-rail business

¹ For further details, please see previous articles such as Mizutani (1999) and Mizutani and Nakamura (1997, 2000, 2004).

endeavors have begun to be allowed at stations, such as real estate development and retail outlets. Second, business plans formerly requiring government approval now need only to be reported. Third, offering corporate bonds also used to require government approval, but approval is no longer necessary. Thus, financing methods have become more flexible.

5 COMPETITION POLICY IN JAPAN

Competition for and within the market among rail operators is almost unheard of in Japan, but this does not mean that rail competition policy does not exist. An indirect competition policy in the form of yardstick regulation has been adopted. This section explains the yardstick regulation scheme and its effects, examining whether or not the scheme can be effective in creating competition among operators.

5.1 Yardstick Regulation as a Competition Tool

The fifth section concerns competition policy. Compared with European countries, direct competition among railways in Japan is limited. In particular, competitive tendering for railway lines and railway network in general does not occur in Japan. Instead, yardstick regulations are applied to 15 large railways, 10 public subways and 6 passenger JR companies. In this section, the yardstick regulation scheme and the effects of the scheme are described.²

Yardstick regulation is used to evaluate rail operators when individual operators change rail fare. In this scheme, a regulator sets up several performance measures, such as operating cost, and evaluates rail operators' performance. Five measures of operating cost are used: (i) track costs, (ii) catenary costs, (iii) rolling stock costs, (iv) train operating costs, and (v) station operating costs. The standard costs for these five measures are obtained by using each individual rail operator's data. The standard cost of each individual rail operator is considered as the cost, excluding noise and conditional differences such as market. And, by comparing the actual cost of each rail company with its standard cost, the performance of each rail company is evaluated. If a rail operator has higher actual costs than the standard costs, then the rail operator is considered a less efficient rail operator. As a penalty, this less efficient rail operator is expected to reduce actual costs. On the other hand, the more efficient rail operator, whose actual costs are lower than its standard costs, can be rewarded for its efficiency by being remitted half the difference between the actual and standard costs.

5.2 The Effects of Yardstick Regulation

The general attitude in Japan is to use indirect rather than direct competition. Mizutani (2005) explains that the rail system in Japan is based on incumbent operators and that the system has both advantages and disadvantages. One advantage is that a rail operator can concentrate on providing better service in the long run, because the system protects incumbent rail enterprises from potential entrants as long as incumbents' services are not egregiously bad. Although there is no direct competition with potential rail entrants, there is always competition with other transportation modes such as the private auto. Furthermore, as private railway companies develop areas along rail lines and stations by building housing and operating department stores, they have incentives to provide better and more varied service to capture rail passengers. However, the efficiency of incumbent rail operators may suffer in the absence of

² In addition to yardstick competition, there are other kinds of competition in Japan, such as competition in the same market. As for details of this kind competition, see, for example, Mizutani and Nakamura (2000).

rigorous competition, especially in large metropolitan areas. In order to avoid inefficiency due to a monopolistic situation, the yardstick regulation scheme has been introduced. It is necessary to determine from empirical data, however, whether yardstick regulation really works.

In fact, there is empirical evidence regarding yardstick competition. First, the Committee of the Regulatory Impact Study on Government-Regulated Public Service Charges (2005) investigates the effect of the comprehensive yardstick regulation introduced into the rail industry in 1996. According to this study, the suppression effect on fare increase due to yardstick regulation was 1.1 to 5.5 yen per passenger, so that total user benefits in the Tokyo metropolitan areas were 5.3 billion yen in 2000. Second, Mizutani et al. (2009) investigated the effectiveness of yardstick regulation by using a data set of rail companies in Japan and estimating the variable frontier cost function. They found that railways subject to yardstick regulation improved cost efficiency by about 11.5% between 1995 and 2000.

However, it is necessary to refrain from drawing conclusions. It can be assumed that yardstick regulation is to some degree effective. Nevertheless, as the former study has weaknesses, it remains unclear whether the effects were caused only by yardstick regulation. Second, even if yardstick regulation is effective, it is unknown how long the effect continues. Third, it is necessary to know whether the same effects are generated when we apply yardstick regulation to the public sector. These are questions to be explored in future research.

6 UNBUNDLING POLICY IN JAPAN: THE JAPANESE APPROACH

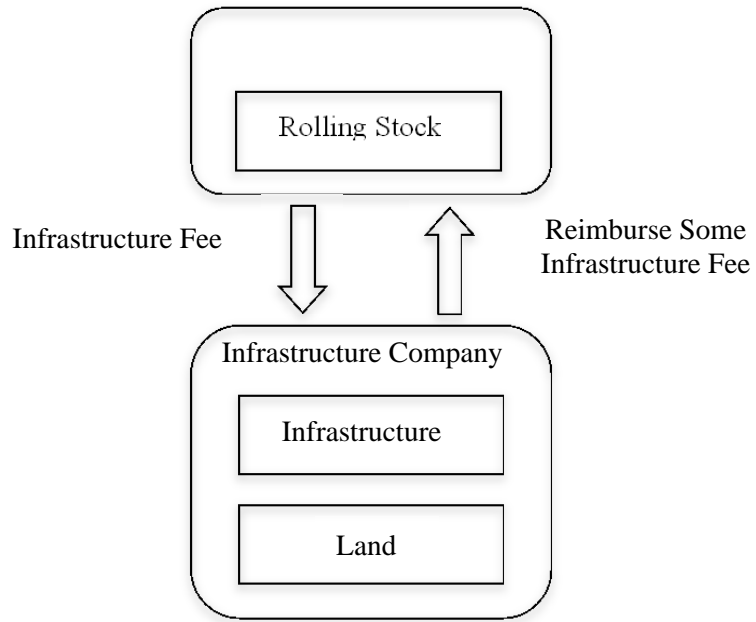
In this section, I would like to explain unbundling policy in Japan. While vertical separation is a common policy in Europe, vertical integration is the norm in Japan. However, there are cases of vertical separation in some urban areas in Japan, such as Kobe Rapid Transit, Narita Airport Rapid Transit, and Kansai Airport Rapid Transit. The Kobe Rapid Transit is an especially well-known case of vertical separation, as it was established in 1958 to connect several private rail networks downtown Kobe.³ In addition to these cases in urban areas in Japan, other cases of vertical separation have been seen in rural areas as well. In this section, I will explain vertical separation policy in rural areas.

Vertical separation in Japan is basically taken by both class 2 railways (Rail operation company) and class 3 railways (Rail infrastructure holding company). However, there are now new variations in vertical separation, with new cases being developed recently for financial reasons. In the railway industry, the full cost principle is still the ideal, with the costs of railways expected to be covered by fare revenues. Even infrastructure costs are included in the costs. However, railway services in non-metropolitan areas are facing difficulties in maintaining their business because the demand for railway services has been declining. Many railway companies in small urban areas cannot maintain their business without relying on operating subsidies or somehow supplementing their finances to renovate infrastructure. In order to reduce the financial burden to the railway company, the vertical separation policy is used.

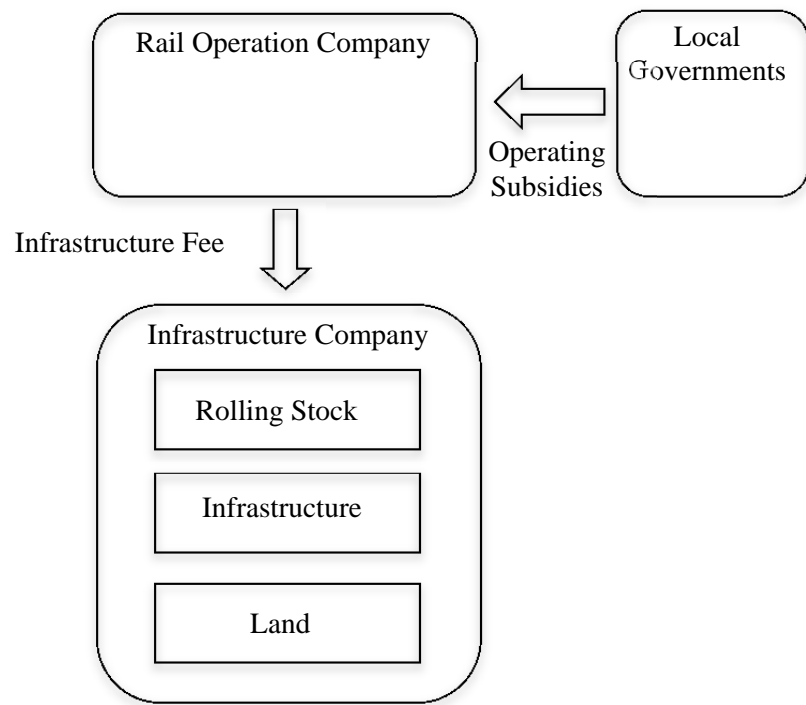
In regional areas, vertical separation is classified into four types, as Figure 1 shows.

The first type is a case of institutional vertical separation, whereby railway organizations are separated into a rail operation company and an infrastructure company. This type is further divided into two types: rolling stock held by a rail operation company and rolling stock held by an infrastructure company. As the figure shows, the rail operation company is financially supported by an infrastructure company or by local governments. Aoinomori Railway and Yoro Railway are examples of this type.

³ Details of the case were provided in Mizutani and Shoji (2004).

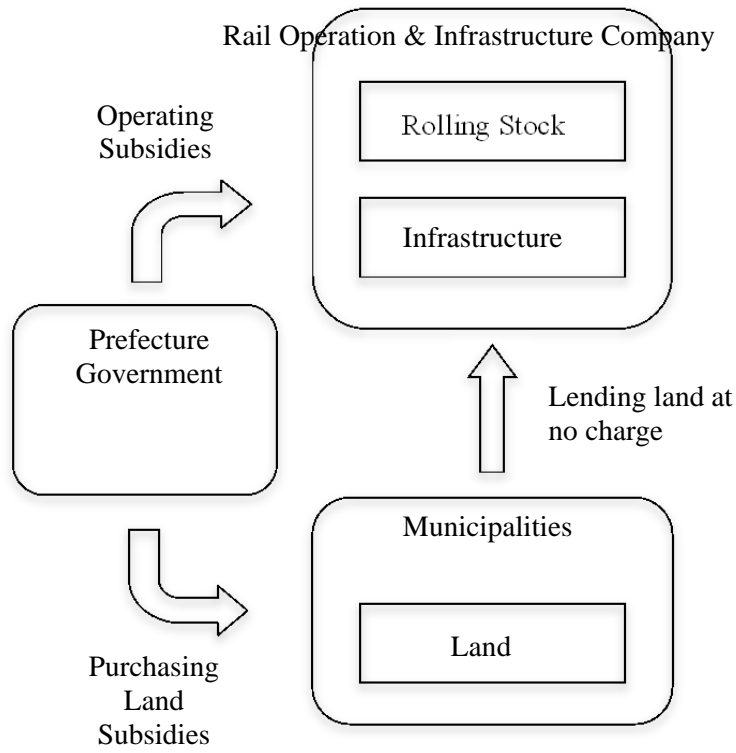


(a) Institutional Vertical Separation-Type 1

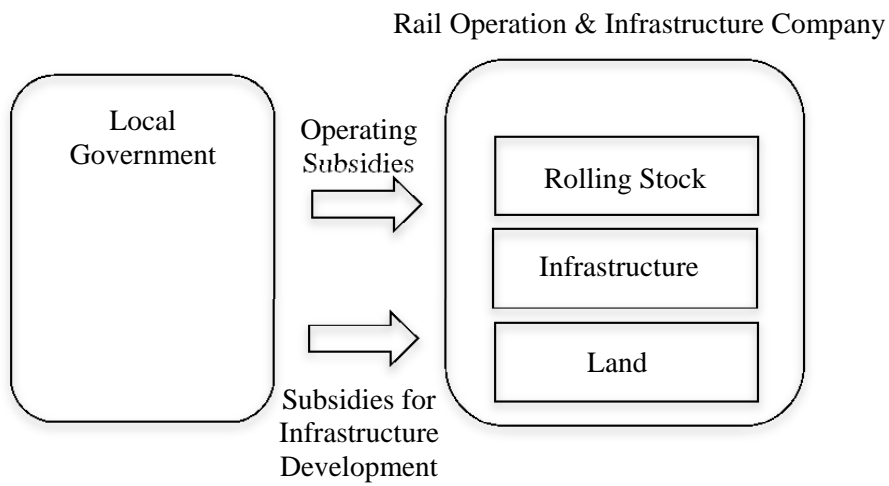


(b) Institutional Vertical Separation-Type 2

Figure 1 Types of Vertical Separation
(continued)



(c) Partial Institutional Vertical Separation



(d) Accounting Vertical Separation

Figure 1 Types of Vertical Separation

The second type is a case of partial institutional separation, whereby local governments own portions of railway assets (e.g. land), except for rail facilities. This type allows the railway company to be financially supported by holding a portion of facilities, in a kind of private-public partnership. Wakayama Railway and Sangi Railway are examples of this type.

The third type of vertical separation involves accounting separation. Although a railway company holds all kinds of facilities, the railway company provides railway services. In order to receive certain kinds of subsidies, each activity's accounting costs are separated. Echizen Railway, Jomo Railway and Joshin Railway are examples of this type.

Thus, some kinds of unbundling are quite different from those in Europe. The main purpose of vertical separation in Japan is as a tool of financial support by local governments. On the other hand, the unbundling policy is also used as a competition tool. Even if an infrastructure company is vertically separated in Japan, that company is not quite different from an infrastructure manager in Europe.

It is still hard to provide rail services with financially healthy figures, even if railway organizations in rural areas take the vertical separation scheme. For these organizations, it might become necessary in the future to stimulate competition for the rail track by promoting new entrants with competitive tendering. On this point, policy makers in Japan should learn lessons from the European experience.

7 LESSONS FOR EUROPEAN RAILWAYS: JAPANESE POINT OF VIEW

In this section, by focusing on competition and regulation policy, the unbundling scheme, and demand creation, I would like to discuss possible lessons for European railways from non-European railways, with a particular emphasis on Japan.

First, the essence of common policy in the European rail industry is that fair competition is applied to any qualified rail operator wishing to enter the market. This policy is designed to foster opportunities for any qualified rail operators and to prevent inefficiency among incumbent rail operators resulting from a monopolistic environment. On the other hand, in the Japanese rail market, new entry into the existing rail system happens quite rarely, so that incumbent rail operators are in a monopolistic position. However, compared with European rail operators, Japanese rail operators can stand alone financially and are not dependent on subsidies. European policy seems to depend too much on direct competition in the market. Competition is certainly necessary in order to improve efficiency, but a new entrant's entry into the market does not always ensure long-lasting efficiency. For example, researchers find differing results when investigating whether competitive tendering cases in Europe contribute to the reduction of costs or fail to reduce cost (e.g. see Nash, 2010). One possible reason for this difference might be the result of poorly designed regulation after the rail operator is selected. On the other hand, in Japan, stable service provision to rail users takes priority over competition among rail operators. Therefore, yardstick regulation among rail operators is applied to prevent inefficiency of existing rail operators. An indirect competition scheme such as yardstick regulation might be one option to maintain efficiency in some cases.

Second, while vertical integration is common in Japan and the U.S., vertical separation is common in Europe. The European Commission seems to carry the policy even further, with its tendency to separate operation and infrastructure institutionally. This policy seems to be applied to all EU railways. However, in terms of cost, vertical separation is not always advantageous. Current empirical research by Mizutani and Uranishi (2013) show that vertical separation is cost advantageous when there is low train density but that it is more costly when there is high train density. Nash (2008) classified vertical separation into three types: the Swedish model (complete separation), the German model (holding company), and the French model (separation of key powers). Even in Japan, there are several types of unbundling.

Instead of applying a universal separation policy, the unbundling scheme should be tailored to each country's environment.

Third, what most distinguishes Japan from Europe is the private railways' demand creation activities. Most railway policies in Europe focus mainly on how to improve each rail operator's efficiency and create a fair competitive environment. On this point, European policies, although there are many variations among countries, are advanced. However, there are few options for stimulating demand. The demand for transportation is in general a derived demand. Therefore, in order to increase rail ridership or rail share, strategic actions by the rail operators and cooperation with other business activities are necessary. It is well known that privately owned railways in Japan have been taking business diversification strategies (e.g. shopping complexes near terminal stations, housing developments along rail lines, professional sports operations). Although a direct transplant of these systems to European railways is not possible, it is possible at least for European railways to cooperate with other organizations and firms.

Fourth, as for types of regulators in the rail industry, Japan's is the ministry-type, which does not separate application of regulation from general rail policy making. Compared with other regulation types (i.e. railway authority-type or the special-regulation type), it seems that there are three potential problems with the type of regulator in Japan. First, there is a limited number of professional regulation specialists who know both transport regulation economics and railway technology. Ministry-type regulators are mostly general administrators with limited specialized knowledge. Second, fair evaluation based on regulation might face interference. For example, if a rail operator feels that the application of regulation seem to be unfair, the operator might self-censor and fail to verbalize its objection to the ministry out of fear that it would later be treated unfairly in the allocation of subsidies. Last, rail operators might affect the ministry politically through the use of politicians, resulting in the creation of regulations advantageous to operators but not to users. Therefore, regulatory authority should be separated from policy making with regard to railways.

Last, cooperation among rail companies seems to have in general not been seen in Europe, although the Japanese experience demonstrates the benefits of cooperation. The benefits of cooperation can be seen in the Shinkansen system, which is operated directly and jointly by several JR companies: the Tokyo-Osaka route (the Tokaido Shinkansen) by JR Central, and the Osaka-Fukuoka route (the Sanyo Shinkansen) by JR West. This direct, smooth train operation by JR Central and JR West cooperatively creates more user convenience, which has resulted in more mode share compared to air transportation. As a second example, even in urban transportation, there are a lot of cooperative projects. In Tokyo, Tokyo Metro is mainly providing service in downtown Tokyo while private railways operate more in the suburbs. Many Tokyo Metro and private railway lines have been directly connected, reducing users' travel time. Thus, cooperation between rail operators is as important as competition in improving rail transport.

8 CONCLUSION

The main purpose of this chapter is to summarize regulatory structure and reforms in the rail industry in non-European countries and to find possible lessons for European railways. Although I briefly describe the circumstances in Australia, the United States, Russia and Japan, the main focus is Japan because its rail regulatory structure is quite different from that of European countries. The characteristics of the rail industry in Japan and lessons for European railways are summarized as follows.

First, most railways in Japan are privately owned and continue to play an important role. Passenger rail transportation is vital but freight rail transportation is relatively minimal,

in clear contrast to the US, where freight rail dominates and passenger rail is less important. In order to stimulate rail demand in Japan, many private railways run non-rail businesses such as real estate development, department stores, bus operations, and so on, all of which can increase rail ridership in urban areas.

Second, regulation and competition policy are quite different from what exists in Europe. The regulator is not independent from the ministry (and is thus the ministry-type). Compared with European countries with independent regulators, the system in Japan seems to be weak in terms of fairness and strictness in applying regulations. Entry into the rail market remains regulated by the use of a permission system. In fact, competition for entry into the rail market and competition within the market among rail operators is almost unheard of in Japan, where an indirect competition policy such as yardstick regulation is adopted instead. The yardstick regulation scheme is applied to three groups: (i) 15 large private railways, (ii) 6 passenger JRs, and (iii) 10 subways. Empirical results show that the scheme is to some degree effective in reducing railway costs among operators. Although direct competition in the market is important, Japan's experience with an effective indirect competition scheme such as yardstick regulation might serve as a lesson for Europe, even though rural areas in Japan might benefit from instituting more competitive European-style tendering schemes.

Third, while competition among rail operators is important, cooperation among rail operators is also important. As competition among rail transportation and other transportation modes becomes more strenuous, cooperation among rail operations is necessary in order to increase the attractiveness of rail services.

Fourth, railways in Japan are in general vertically integrated. This is quite different from the situation in Europe. The main reason for vertical integration is the difficulty of unbundling rail assets, as most railways are privately owned and there is such a multitude of operators (i.e. about two hundred rail operators). However, there exist some vertically separated railways in Japan that have adopted the separation scheme mainly for financial reasons. In rural areas, private railways are facing difficulties in running rail operations without subsidies, and vertical separation is chosen to reduce financial burdens (e.g. the infrastructure costs of railways), and not for the purpose of introducing competition. Furthermore, recent empirical research shows that vertical separation is cost advantageous when there is low train density but that it is more costly when there is high train density. As there are various types of vertical separation, the unbundling scheme should be adjusted appropriately to each country's environment.

Last, because transportation is a derived demand, it is also important to glean benefits from private railways' strategic behavior, especially their skillful promotion of rail demand through business diversification (e.g. shopping complexes near terminal stations, housing developments along rail lines, professional sports operations). Although a direct transplant of these systems to European railways is not possible, it is possible at least for European railways to cooperate with other organizations and firms.

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[2014.9.26 1171]