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**RESTORATION OF RAILWAY BUSINESS IN JAPAN:
A QUARTER OF A CENTURY FOR PRIVATISED COMPANIES**

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Introduction

Japanese National Railways were privatised in 1987. At that point however, privatisation meant that the form of the company changed to a joint-stock company, and ownership was retained by the government. In other words, the sole shareholder of JR companies was JNR Settlement Corporation, which was essentially the government.

Characteristics of privatisation of JNR were that the company was divided regionally. Division of operation and infrastructure was common in EU countries, but this form of division did not take place in Japan. In regional dividing, six passenger transport companies were established. Of those, three were in Honshu or the mainland, and were set up in metropolitan areas such as Tokyo, Osaka and Nagoya, linked by a major trunk line known as the Tokaido line.

The remaining three companies were set up in the three other large islands; Hokkaido, Shikoku and Kyushu, all of which had rural lines only. Japan is composed of many islands, but Honshu, Hokkaido, Shikoku and Kyushu are the four major islands, and railways were built on these four islands only. Honshu and Kyushu have been linked by a railway undersea tunnel since before WWII.

Hokkaido and Shikoku were linked with Honshu by an undersea tunnel and a great bridge over the sea, respectively, soon after privatisation. So, all four islands are now linked by rail. In fact it was cynical that a nationwide company, JNR was divided into six companies, when all four islands were linked by railway, upon completion of a long-desired tunnel and great bridge.

With railway service in Japan, passenger transport is the main part of the business, but there is also a freight service. For transport of freight, one nationwide railway company was established separate from passenger transport. This company has no infrastructure, but uses the tracks owned by the passenger transport companies, and pays usage fees.

Looking at this point only, infrastructure and operation are divided for the freight transport company, but unlike EU countries, entry of other operators to the railway

business was not liberalised to introduce a competition policy. In the privatisation of railways in Japan, there was no such notion of promoting competition by allowing new entries to the railway business.

The railway business has been exposed to severe competition from motorways, automobiles and aeroplanes. This competition can only become increasingly severe and will never be easier. Within the nation also, there were no voices raised demanding the entry of new railway operators. Meanwhile, the soundness of business operation of the three passenger transport companies in the three large but not main islands, and the freight company, were suspect.

Including the three companies in Honshu, the outlook for all the JR companies established as a move towards privatisation, was not an optimistic one at the outset. Consequently, their capital investment was controlled, and employees were strictly managed under a careful business management policy. However, the three companies in Honshu, particularly JR East, which has Tokyo within its business region and JR Central which has the Tokaido trunk line, showed smooth progress in business operation and gave the impression that the privatisation policy was successful. Three companies in Honshu were listed on the Stock Market, thus achieving privatisation in a real sense.

With regard to the three companies in the three largest but not main islands, a business stabilisation fund was set up which earned high interest at the outset, sufficient to support the three companies as planned. The three companies invested in increased train speeds, and were poised to grow into high efficiency companies. In the case of JR Freight, the company invested in higher train speeds, construction of electric freight trains, and increased the number of wagons per train.

The first 10 years of privatisation was the period when benefits of the policy appeared most prominently, and a significant improvement was made compared to the business condition at the end of the JNR era. This condition is described in “1. Effect of privatisation”, “2. Clearance of long-term debt” and “3. Evaluation and tasks of government’s view point”, based on the government’s Transport White Paper. In particular, “3. Evaluation and tasks of privatisation”, shows how the government evaluated the policy.

However, a serious accident occurred for JR West, which had the weakest business foundation out of the three JR companies in Honshu. In addition, another three JR companies in the previously-mentioned three islands started to face difficulty in management due to a reduction of population, improved

motorway network, and reduced bank interest paid on the business stabilisation fund. JR Kyushu with a relatively favourable location began the process of being listed on the Stock Market, but this does not mean that the company's revenue from the railway business showed a significant improvement.

As a result of regionally dividing the railway network, growth or decline in population and the economy of each region were directly reflected in the business of each JR company, creating differences between the JR companies. On the one hand was a company that started construction of Maglev, while on the other was a company for whom continuation of service was in doubt. These concerns that became apparent after a quarter of a century will be touched upon in "5. Problems that became apparent".

Including construction of Maglev, capital investment in railway business was losing consistency. This issue is discussed in "6. Direction of capital investment". Finally, what happened to the debt of JNR, namely the major reason for privatising the railway business, is explained in "7. Outcome of JNR debts".¹

1. Circumstances of transport²

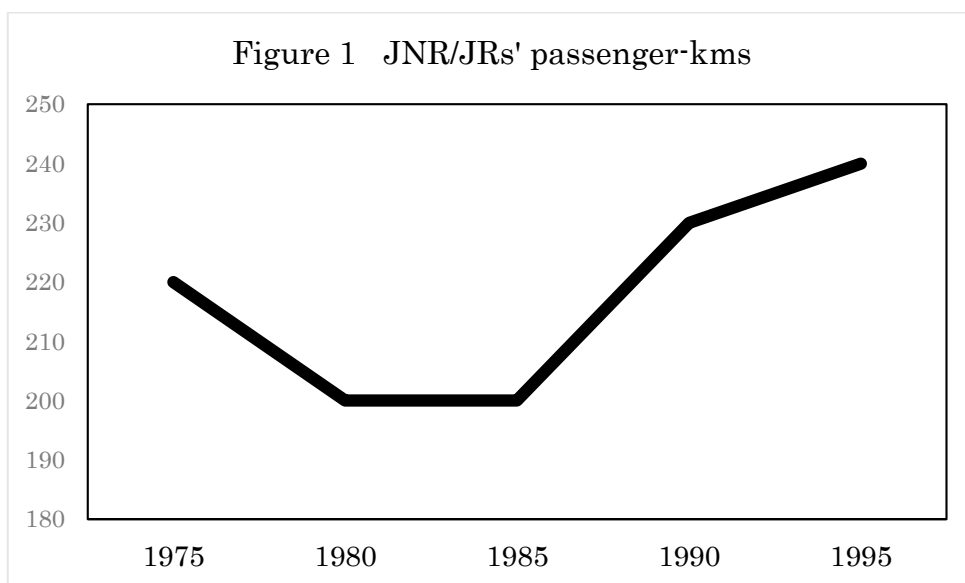
1.1. Passenger transport

The volume of passenger transport, passenger-kms basis by Japanese National Railways (JNR) that had been reducing since it peaked in fiscal 1974, showed a steady increase after division of the organisation accompanied by privatisation. It is attributable to deferred train fare increases, improved services by the six privatized railway companies (JRs), as well as construction of the Seikan channel tunnel and the Seto channel bridge.

Supported by favourable domestic economic growth, transport volume made a remarkable increase from 1987 to 1991. Transport volume declined as a result of the Hanshin-Awaji earthquake in 1994. However, except for that year, transport volume showed an increase between 1992 and 1995, but it was slight due to an economic recession.

Comparing the passenger transport of the six JR companies with that of the JNR era, the average annual growth for the 10 years from 1977 to 1986, the period just before division and privatisation was 0.6 per cent, while that for the nine years after privatisation, from 1987 to 1995, was a 2.6 per cent annual average.

Furthermore, when we look at the share of the six JR companies in the entire domestic passenger transport sector with that of the JNR era, which was reducing continuously, the figure shifted to around 21 per cent since privatisation, showing the brake had been applied to the downward trend of market share that continued in the JNR era (Figure 1).



Volume of passenger transport by the six JR companies, former JNR.

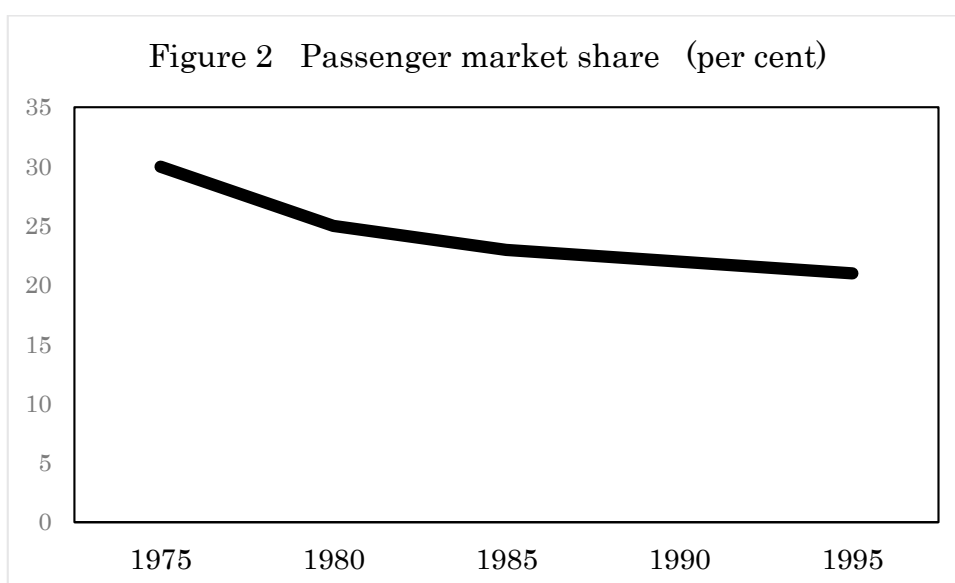
100 million passenger-kms

Source: *Railway Statistics* and *Transport White Paper 1996*. Same applies to other figures.

The 2.6 per cent average annual growth rate in passenger transport volume achieved by the six JR companies for the nine years after privatisation, from 1987 to 1995, is higher than that of private owned railways, which was 1.2 per cent. When we look at the transport volume, number of passengers, in major cities by JR East, JR Central and JR West and compare with that of competitors, namely private owned railways in metropolitan areas such as Tokyo, Nagoya and Osaka areas, the private railways' increase in 1994 was 11.1 per cent, while that of these three JR companies located on the main land together were significantly high, at 25.2 per cent. This indicates that the three JR companies in the three metropolitan areas have regained their competitiveness against private owned railways.

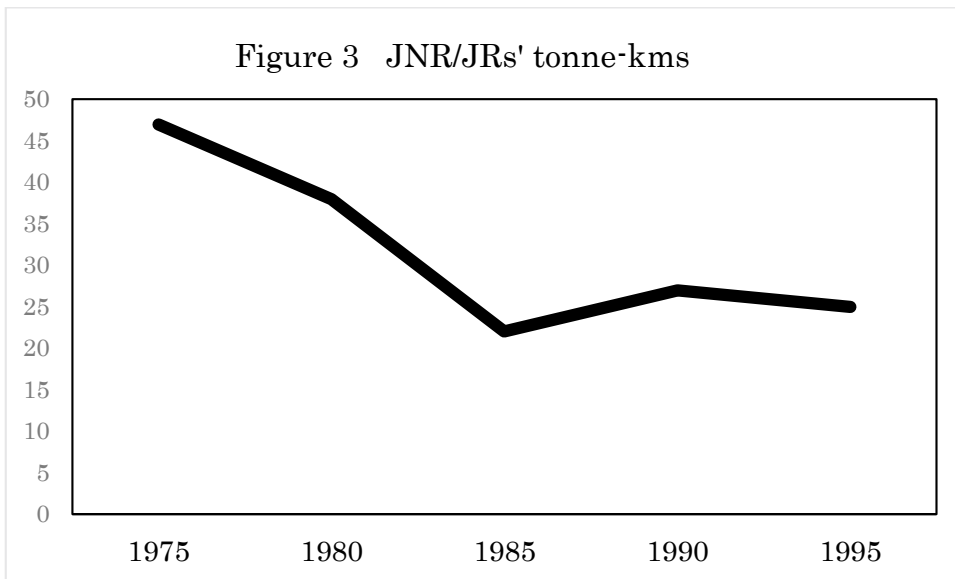
Looking at the by-zone share of JNR against the six JR companies in 1986 and in 1994 respectively, it was lower in over 750 km zones, but higher in 500~750 km zones. Meanwhile, market share in 1994 was lower in both under 300 km zones and over 750 km zones, but higher at 50 per cent to 70 per cent in 300~750 km zones.

This means in zones under 300 km, automobiles are the major means of transport, while the aeroplane is advantageous in zones over 750 km. However, when it came to the between 300 to 750 km zone, namely medium distance intercity passenger transport, JR companies still remain competitive (Figure 2).



1.2. Freight transport

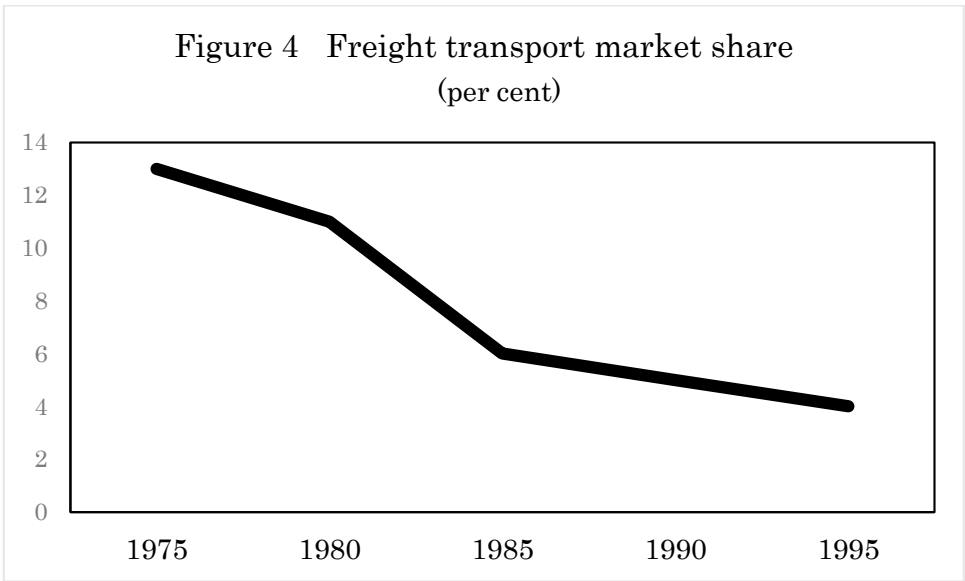
Since peaking in 1970, JNR freight transport volume, tonne-kms basis, which had been in decline over a long period, showed significant growth after becoming JR Freight, being supported by a buoyant domestic economy. This reduced from 1992 due to an economic recession, but showed an increase in 1995 as a reaction to the decline that resulted from the Hanshin-Awaji earthquake that occurred the year before (Figure 3, 4).



100 million tonne-kms

Comparing JR Freight's transport volume with that of the JNR era, the annual average rate of increase for the 10 years before privatisation, 1977~1986, was minus 7.9 per cent, while that for the nine years, 1987~1995, after division and privatisation was plus 2.4 per cent.

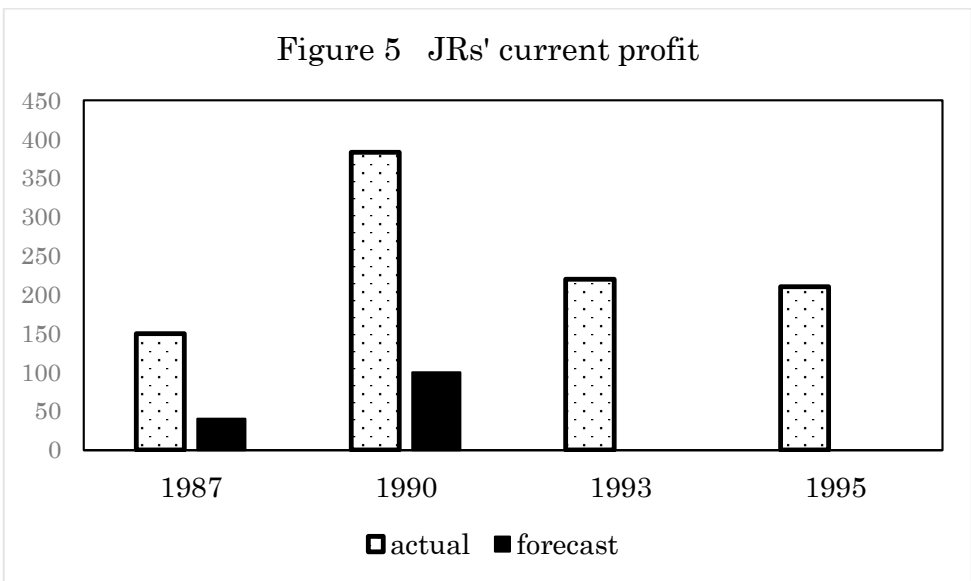
The share of JR Freight in total domestic freight transport, ton-kms basis, levelled or reduced slightly after privatisation, but it can be said that the rate of reduction has eased compared to the JNR era. Looking at progress of JR Freight transport volume, tons, by distance zone from 1986 to fiscal 1994, it increased significantly in zones of over 500 km compared to other distance zones, due to a trend of using containers, and competitiveness was retained in long-distance container transport .



1.3. Condition of business

(a) Business operation

Current net loss of JNR in 1986, just before privatisation was 1.316 trillion yen, but after privatisation, current profit and loss of the seven JR companies in total has been in the black. In 1990, the businesses made their largest profit of 382.6 billion yen. While in 1995 their profit was 209.9 billion yen. Total current profit of the seven JR companies in the five years after privatisation exceeded the government's estimate (Figure 5).



JR East, JR Central and JR West on main island, Honshu

With regard to JR East, JR West and JR Central, each having a metropolitan area as well as a Shinkansen line within their business sphere, their business environment has been favourable. Being supported by an increased need for transport in a favourable domestic economy, the three companies continued a generally smooth business operation since inauguration, and their operating profit and loss, and current profit and loss are in the black.

As for JR Central and JR West, operating profit for fiscal 1994 reduced as an immediate effect of the Hanshin-Awaji earthquake that occurred in January 1995, but recovered by the end of fiscal 1995.

Also, the three companies that inherited a long-term debt of 4.6 trillion yen at the point of privatisation, had additional debts of 9.2 trillion yen incurred in buying off Shinkansen lines from the organization that owned the entire Shinkansen network, in October 1991. For payment of interest on the loan, current profit was significantly low in relation to operating profit.

JR Hokkaido, JR Shikoku and JR Kyushu on three isles

With JR Hokkaido, JR Shikoku and JR Kyushu, a severe business condition had been anticipated since their inauguration. However, there has been improvement in operating profit and loss thanks to an increased demand for transport, accompanied by increased domestic economic growth, in addition to improved services, and aggressive rationalization of management.

In terms of current profit and loss, the companies remained in the black until 1993, because of an investment profit from the business stabilisation fund. However, in spite of the effort made for improved operation profit and loss, business stabilisation fund investment profit reduced due to lower bank interest rates, and the financial condition of the three companies deteriorated.

As a result, JR Shikoku and JR Kyushu recorded a 500 million yen current loss in 1994 for the first time. The three companies were expected to make a current loss for 1995, and were expected to make an even bigger loss in 1996. Consequently, train fares were raised for the first time in nine years.

JR Freight

Supported by increased demand for transport due to a favourable domestic economy, JR Freight increased business profit smoothly, and posted a current profit until fiscal 1992.

However, with the impact of the recent economic recession and Hanshin-Awaji earthquake in January 1995, operating profit began to decline after peaking in 1991, and recorded an operating loss for the two consecutive years from 1994. In terms of current profit & loss, the company made a loss for the three consecutive years from 1993.

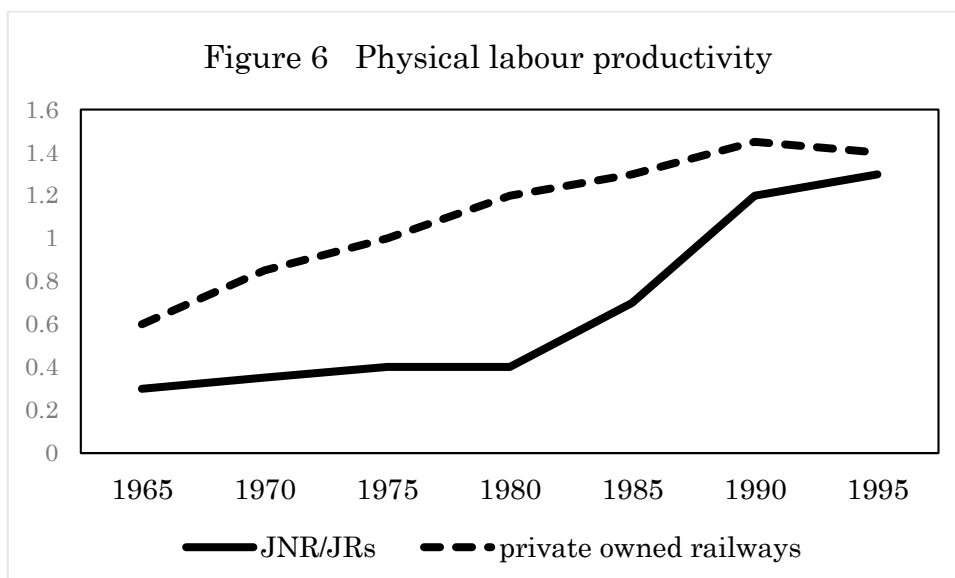
(b) Train fares

In the JNR era, train fares were raised nearly every year in order to secure transport revenue. Trial calculation of the seven JR companies established at the time of JNR reform, also expected an annual increase of 3 to 6 per cent in train fares for the period of 1987 to 1991.

However, except for an increase, 2.9 per cent for passengers, 3 per cent for freight, due to introduction of the consumption tax in April 1989, JR train fares remained unchanged after privatisation, even though private owned railways raised their fares and consumer prices also increased until January 1996 when the three JR companies, namely JR Hokkaido, JR Shikoku and JR Kyushu raised their train fares.

(c) Increased productivity

Looking at JR companies' productivity on a tonne-kms / passenger-kms base per person for all employees, it showed a leap compared to JNR era (Figure 6). Meanwhile, in terms of proportion of labour costs against transport revenue of the railways division, it has been low at around 30 per cent after privatisation.



(d) Assurance of workplace discipline

During the JNR era, it was not easy to take action for a healthier management, due to disruption of discipline at the workplace attributable to conflicts between labour and management. However, the labour-management relationship improved after division and privatisation of the operation, and workplace discipline was secured, which greatly contributed to improvement of service and business results.

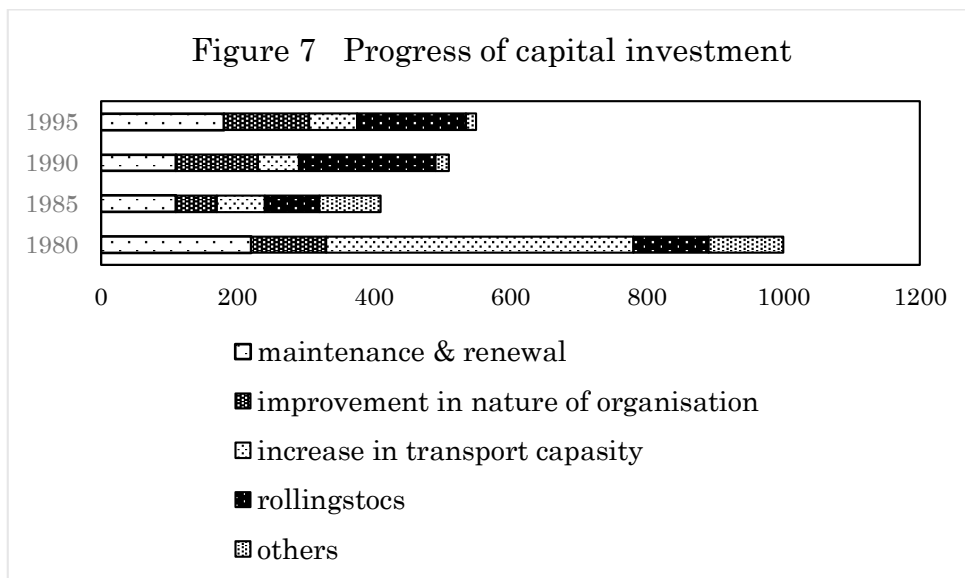
(e) Capital investment

Capital investment in the JNR era that increased to the one trillion yen level per year by mid-1975, reduced in 1987 following the trend of restraint in investment, which started from just before privatisation. Investment increased slightly after 1988.

After privatisation, decisions on capital investment were made independently by each JRs based on feasibility, investment efficiency and improved user convenience. Consequently, investment in “carriages” which was about 10 per cent in the JNR era, increased to nearly 30 per cent following privatisation, which improved transport service.

Furthermore in the JNR era, investment in automatic ticket barriers as a labour saving measure and business diversification was around 10 per cent, but this increased to nearly 30 per cent in 1995. Meanwhile, investment in construction

of new lines that formerly reached nearly half the total investment in 1980, reduced to around 20 per cent after privatisation (Figure 7).

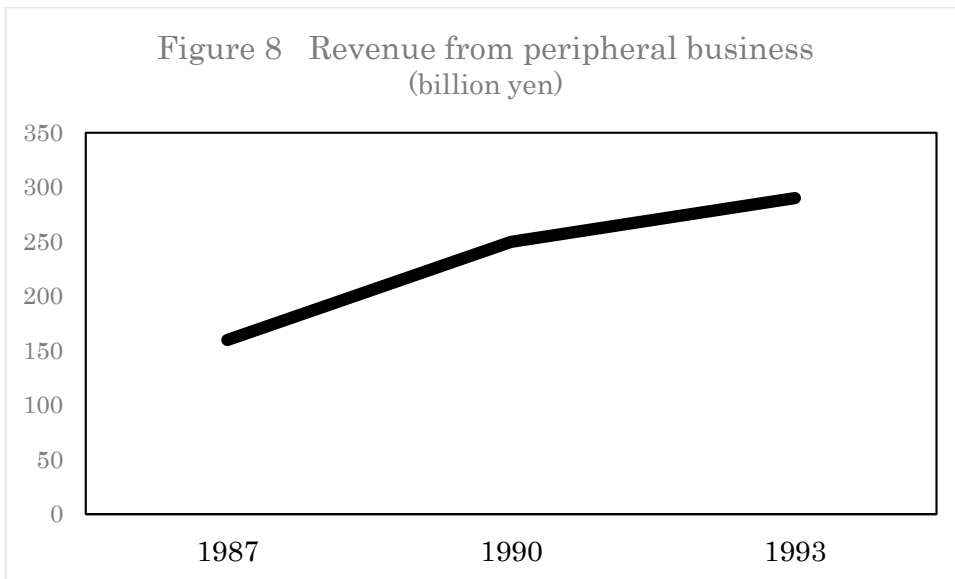


(f) Scope of business - Steady increase in proportion of revenue from peripheral businesses in operating income

JNR was a business entity with the objective of improved public welfare, and its business scope was limited to achievement of this objective. However, privatisation allowed JR companies to increase the diversification of their business scope, and they are now operating travel agencies, real estate, hotel businesses and more.

Looking at progress of total revenue in fiscal 1985, which was in the JNR era, this was 100.4 billion yen and this increased steadily after privatisation to become 286.1 billion yen in 1995, which was an almost threefold increase over 1985. Proportion of revenue from peripheral businesses in operation increased gradually, and remained higher compared to the 2.8 per cent posted in 1985.

This proportion was high particularly for JR Hokkaido, JR Shikoku and JR Kyushu, with the average of these three companies being 15.3 per cent in 1995, significantly exceeding the average 6.3 per cent of the seven JR companies (Figure 8)



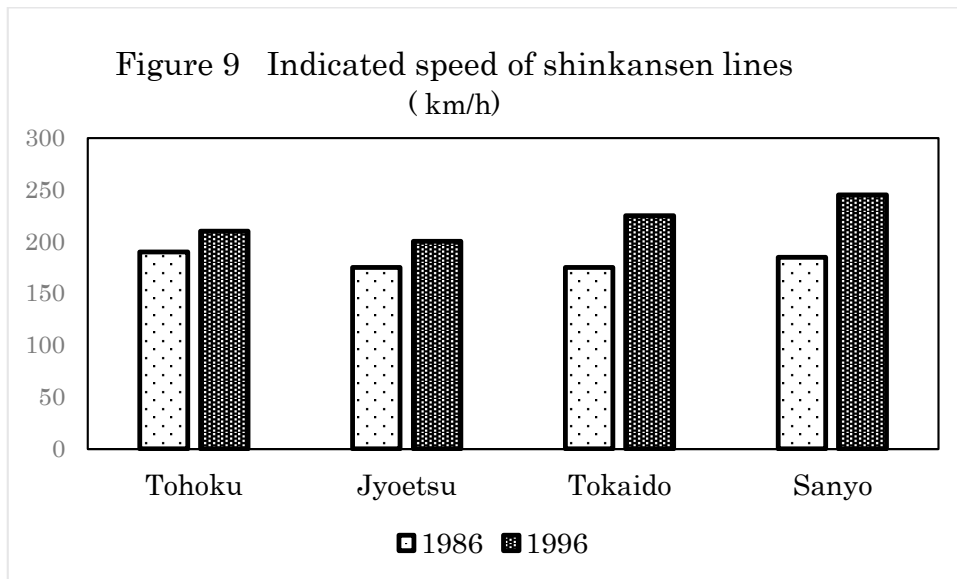
Total income from peripheral businesses of the seven JR companies.

1.4. Improvement of service

(a) Response to customer needs

Improvement of convenience

Measures were taken for improved convenience, through introduction of Nozomi into Tokaido-Sanyo Shinkansen, increased speed of conventional lines (Figure 9), as well as linked operation of Shinkansen and conventional lines, better connection between Shinkansen and conventional expresses, and improved access to airports such as Narita/Tokyo International Airport, Kansai/Osaka International Airport and New Chitose/Sapporo Airport.



- i Indicated speed is the distance driven divided by driven time, plus stopping time at stations
- ii Numbers for 1986 and 1996 were calculated from timetables of April 1986 and August 1996, respectively

Furthermore in metropolitan areas, the Keiyo line was opened to ease congestion during rush hour, the Saikyo line was extended, Shonan Liner trains were introduced and frequency of train services increased for higher transport capacity. However, mainly in the Tokyo Metropolitan area, these measures did not become a fundamental solution to congestion, and additional efforts are required (Figure 10, 11).

Figure 10 Transport capacity in Tokyo
(1961: 100)

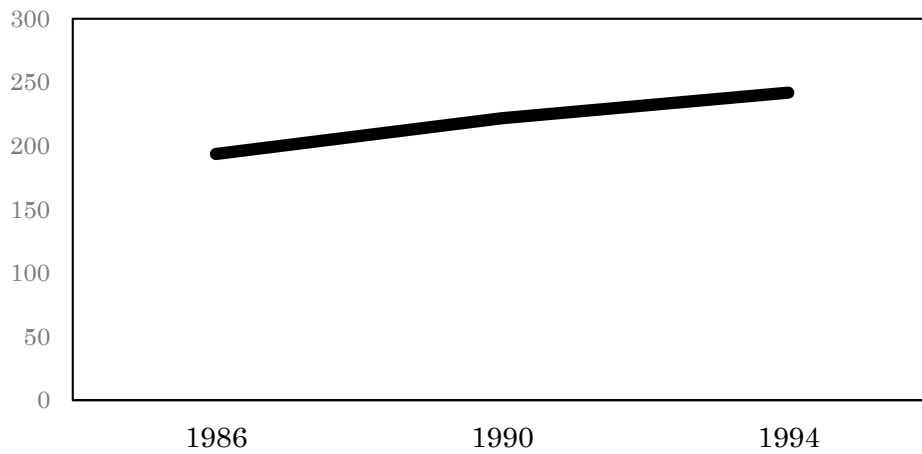
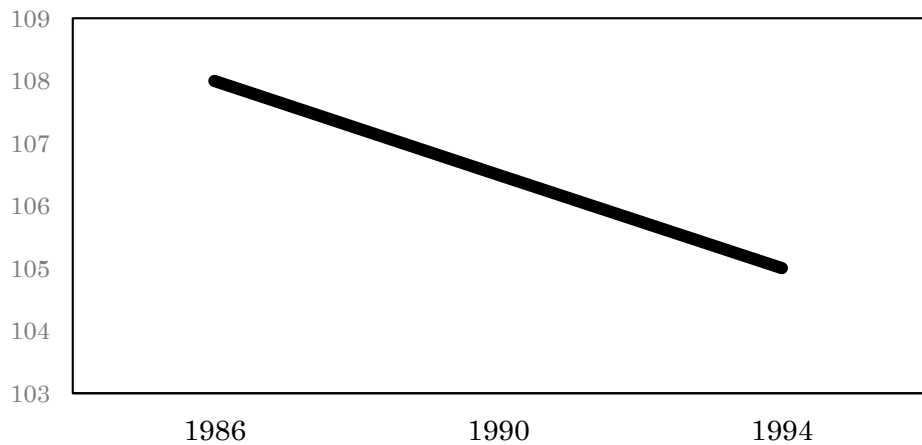


Figure 11 Congestion rate in Tokyo
(per cent)



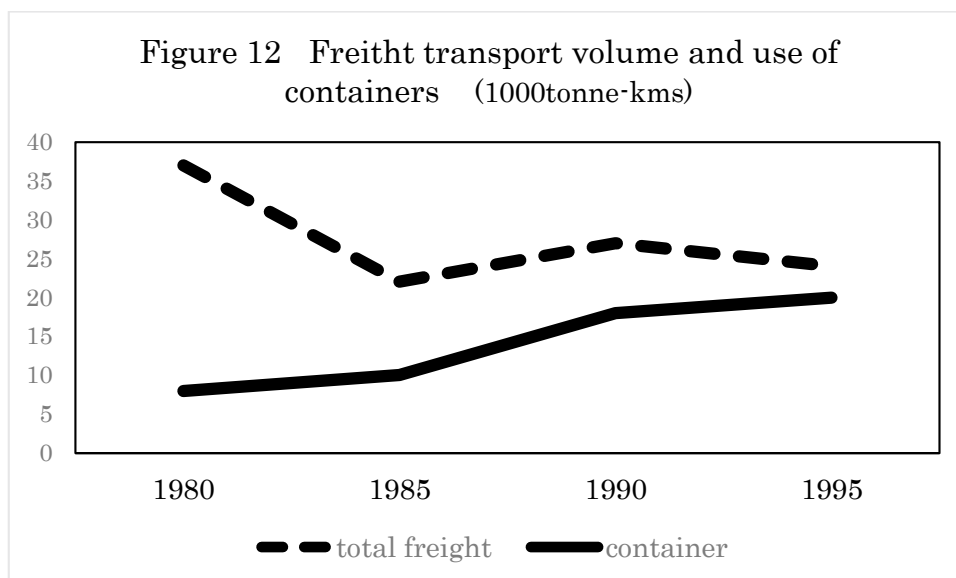
Operation of railways closely linked to community

During the JNR era, the business was operated nationally under a central organization. Consequently, the management became uniform, which made it difficult to create train timetables that met local needs. On the other hand, JR companies are making efforts to create train timetables to meet local needs after privatisation.

For example, in such local cities as Sapporo, Sendai and Fukuoka, frequency of local train services has been increased, while in other local cities, including Nagano, Oita, Akita and Matsuyama, service frequency of intercity express trains and train speeds have been increased, and speeds of local trains have also been increased.

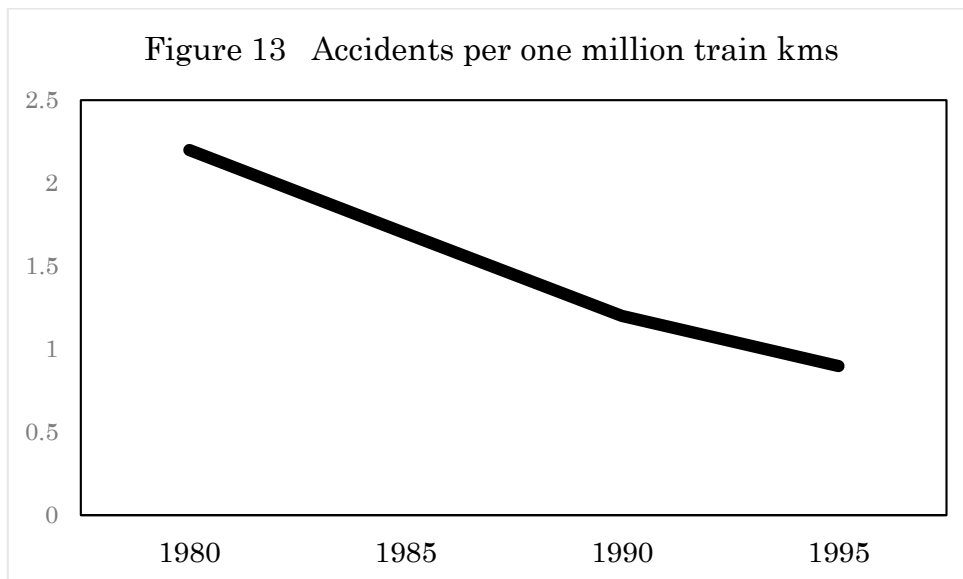
Promotion of container usage

In the area of freight transport, use of containers was promoted in response to an increased need for container transport (Figure 12). Furthermore, new products such as refrigerated containers and piggyback transport have been developed, in addition to reduction of transport time and increase in service frequency for higher capacity.



Safety assurance is the fundamental mission for a transport institution. Consequently, JR made the maximum effort, including the establishment of an accident prevention structure, the setting up of a Safety Measures Department aiming at re-education of employees, and increasing safety assurance facilities for reduced number of train accidents.

As a result of these efforts, train crashes, accidents resulting in derailment and other accidents per million kilometers of train movement have reduced with reduced casualties, after 1991(Figure 13). But, a big accident will be happened in 2005. See following chapter.



(b) Action for increased speed

After privatisation, JR established the Railway Technical Research Institute, by amalgamating the JNR Railway Technical Research Institute and Railway Labour Science Research Institute, for the purpose of R&D of common and essential technologies for the development of railways, and technologies with a high social demands.

Railway Technical Research Institute and JR companies are actively working on R&D of technologies for increased speed of Shinkansen and conventional trains, Maglev (linear motor train), and disaster prevention. The research is showing fruit in increased Shinkansen speed, operating at 300km/h.

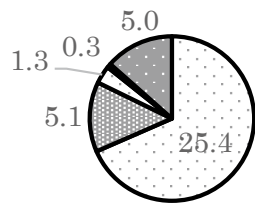
2. Clearance of long-term debt³

2.1. JNR long-term debt clearance policy

(a) JNR long-term debt and its inheritance

JNR drew the line as of 31 March 1987, and at this point, beginning of fiscal 1987, the company's total long-term debt to be cleared reached the vast sum of 37.1 trillion yen (Figure 14). Of said debt, JR companies were to inherit some portion, but to a level that would not prevent smooth and sound operation of the business, and the remainder was to be settled by JNR Settlement Corporation.

Figure 14 JNR long-term dept (trillion yen)



- JNR long-term debt
- ▣ Dept of Railway construction corp. & Seto bridge corp.
- ▨ Stabilisation fund
- Employment measures expences
- ▤ Pension allotment

i JNR long-term debt: Includes operating expenses (0.4 trillion yen) of JNR Settlement Corporation.

ii Debt of Railway Construction Corporation and Honshu-Shikoku Corporation: 1.8 trillion yen (portion assigned to Railway Construction Corp.) for construction of Joetsu Shinkansen. 1.1 trillion yen for construction of Seikan tunnel . 1.6 trillion yen for construction of main trunk line and metropolitan lines. 0.6 trillion yen for railway line on Honshu-Shikoku link bridge.

iii Business stabilisation fund: The fund set up to support with its investment profit, the business of the three companies; JR Hokkaido, JR Shikoku and JR Kyushu, which was expected to show an operating loss.

iv Employment measures expenses: Expenses to pay retirement allowance or vocational training for promotion of re-employment, for the excess manpower allocated to JNR Settlement Corporation.

v Pension allotment: Allotment for pension for which JNR became liable as an employer's responsibility, after the revision of the pension system in 1956.

This meant JR East, JR Central, JR West and JR Freight were to bear a total of 5.9 trillion yen, Shinkansen Holding Corporation to bear 5.7 trillion yen, and the remaining 25.5 trillion yen was to be settled by Settlement Corporation. In the case of Shinkansen Holding Corporation, in addition to the 5.7 trillion yen, the companies were to bear 2.9 trillion yen, which was the balance between Shinkansen lines reacquisition value and book value.

Since a total of 8.5 trillion yen was to be borne by the three JR companies in the form of leasing Shinkansen lines, the actual amount to be borne by the three JR companies was 14.5 trillion yen in total.

(b) Debt clearance policy of JNR Settlement Corporation

It was decided that of the 25.5 trillion yen to be cleared by the Settlement Corporation, the amount finally remaining had to be borne by the nation.

With regard to asset disposition carried out by JNR Settlement Corporation, the corporation was requested to make every effort to reduce nation's burden by efficiently and appropriately disposing of JNR assets, including land and shares, and increasing its own revenue sources.

Own financial sources of Settlement Corporation for clearance of long-term debt inherited were: Real estate (8,808 ha., value for fiscal 1987 estimated at 7.7 trillion yen), shares of the seven JR companies, 9.19 million shares, total face value: 0.5 trillion yen, investment equity in Teito Rapid Transport Authority, TRTA=subways in Tokyo, 310 million shares, valued at 0.7 trillion yen, and credit on Shinkansen Holding Corporation, 2.9 trillion yen, total of 11.8 trillion yen as of beginning of fiscal 1987.

As a result, the ultimate amount of long-term debts to be settled by the nation was calculated to be 13.8 trillion yen, which was the balance of long-term debt of 25.5 trillion yen inherited from JNR Settlement Corporation, and its own financial sources of 11.8 trillion yen (Figure 15, 16).

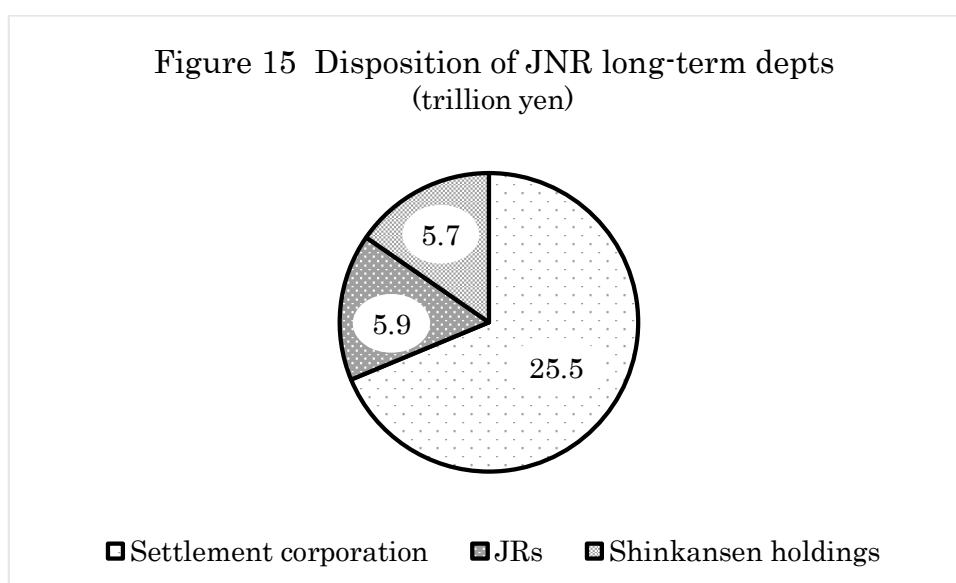
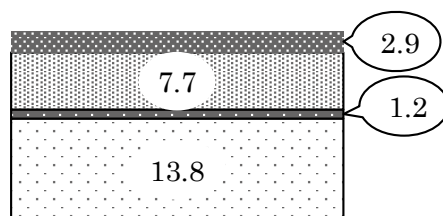


Figure 16 Settlement corporation
(Total: 25.5trillion yen)



- ▣ Credit on Shinkansen Holdings
- ▤ Income from land sales
- ▥ Income from sale of JR shares
- ▦ Burden to nation

2.2. Disposal of Settlement Corporation Assets

(a) Real estate

Non-business purpose land: 8,808 ha.

Of all the land owned by JNR, excluding the minimum land required in future for railway business, all other land was to be sold in principle, and all such land put in the possession of JNR Settlement Corporation. Together with land inherited from Japan Railway Construction Corporation, 8,808 ha. of land were to be sold and the revenue appropriated for repayment of long-term debt.

Temporary freeze on land sales: against background of soaring land prices

In the Tokyo area, land prices began to increase rapidly in around 1985 and rose by 48 per cent in 1987 compared to the previous year. Because of that the government was urged to take countermeasures and decided to freeze the sales of the land owned by the Corporation until the abnormal price increases had stabilised. Later, as the land price settled, the Corporation started to sell off land from June 1989.

Land sales by Settlement Corporation however, had to face a severe situation due to a subsequent period of economic recession with a stagnated real estate market, and continuous fall in land price lasting until fiscal 1996, after peaking in 1991.

Actual land sales: Total of 5,800 ha. 4.6 trillion yen by fiscal 1995

With the above history, land sales from 1987 to 1995 by Settlement Corporation reached some 5,800 hectare 4.6 trillion yen. Of these, some 5,000 hectare approx. 3.43 trillion yen, or in other words, the majority of sales were to the national government or local public entities.

(b) Shares

Transfer of equity in TRTA: Some 0.9 trillion yen to the national government.

The equity owned by Settlement Corporation was to be transferred to the government gradually at an appropriate price, in lieu of repayment of the loan to Settlement Corporation.

Disposition of JR shares: Early sales conducted starting with JR East and JR West.

JR shares held by Settlement Corporation

Shares of JR companies, which had been inaugurated in the reform of JNR, were held by Settlement Corporation in order to facilitate clearance of debt (9.19 million shares, face value of some 0.5 trillion yen) (Table 17).

Table 17 Number of shares of JRs (Oct.1996)

	Face value	Shares issued	Shares held by Settlement Corporation	000 yen
JR East	50	4,000	1,500	2,500 sold in 1993
JR Central	50	2,240	2,240	
JR West	50	2,000	634	1,366 sold in 1995
JR Hokkaido	50	180	180	
JR shikoku	50	70	70	
JR kyushu	50	320	320	
JR Freight	50	380	380	

Source: *Transport White Paper 1996*

Basic policy of selling off shares

As policy of selling off JR shares, it was decided that JR shares were to be sold off effectively at the earliest possible time, and when selling a fair price must be set. While at the same time, the procedure and method must be fair and clear in order to widely provide to the nation an opportunity to purchase, and fully taking into consideration the trend of securities and the financial markets.

Sales and listing of JR East shares

The Transport Ministry appointed JR East as the subject for the share sell off, and began to make preparations. However, the stock market dropped suddenly after the Nikkei average peaked in 1989. Consequently, sales of government owned shares were frozen, and sales of JR East shares in fiscal 1992 were withheld.

In 1993, as the Nikkei average improved to move between 20,000 yen and 21,000yen, and movement of the stock market showed stability, JR East shares were sold and the company was listed on Tokyo Stock Exchange. On this occasion, out of four million shares issued, 2.5 million shares were sold and 1.1 trillion yen revenue was raised.

Sales and listing of JR West shares

As for sales of JR West shares, the company was listed on Tokyo Stock Exchange in October 1996. Out of two million shares issued, 1.366 million were sold and 0.5 trillion yen revenue was raised.

Future action at 1996

Disposition of JR shares needs to be implemented as early as possible from the viewpoint of full privatisation of JR companies and repayment of debt by the Settlement Corporation.

Listing and share sales of JR Central, as well as sales of remaining shares of JR East and JR West that had been listed would be continued, and consideration was given so that privatisation of the three companies would be achieved at around the same period.

Meanwhile, due to a severe business situation, it would be difficult to immediately start processing of the listing of JR Hokkaido, JR Shikoku, JR Kyushu and JR Freight.

3. Evaluation and tasks of government's view point⁴

3.1. Assessment of JNR after 10 years of reform

Significance of JNR reform was to change JNR, which was on the point of bankruptcy, to a business entity capable of being competitive in the transport market, and revise the railway business so that the company could fully perform its role and responsibility.

The cause of the bankruptcy was considered to be the form of national business management under a system of public corporation, so the company was divided into appropriate business units and privatized. At this point, the passenger division was divided into six companies, bearing in mind the actual flow of passengers, and at the same time a profit adjustment measure was put in place as an assured stable business foundation of each company. In the case of freight transport, its management was separated from the passenger division, and a single company was established for a nation-wide service.

As a measure to address an issue of excess manpower, which is one of the problems that accompany a change in the form of a business operation, 20 per cent more than the appropriate number of staff were transferred to each passenger service company, while at the same time applications were invited for early retirement before said transfer, and a re-employment programme was implemented for those transferred to Settlement Corporation.

For clearing of long-term debt, each of the four companies: JR East, JR Central, JR West and JR Freight, bore the burden of debt that corresponded to book value, reacquisition value for Shinkansen, evaluated assets, from the viewpoint of satisfying following two needs; securing of sound business management and reduction of the ultimate amount to be borne by the nation. Revenue from sales of land, stock and assets owned by Settlement Corporation was made to be the financial source of debt clearance, and the nation was to carry the long-term debt that remained.

3.2. Assessment points

(a) Maintained level of train fares

In the JNR era after 1975s, while train fares were raised almost every year, passenger transport volume reduced or stagnated. After privatisation, train fares were maintained at a level before privatisation, except for the increase made by JR Hokkaido, JR Shikoku and JR Kyushu in 1996.

Against the background of stable train fares lies an increased volume of transport, under the smooth economic growth after privatisation. In fact, while

train fares were left unchanged, making JR companies more competitive against other transport institutions, services were improved by JR, which led to further increases in volume of transport, creating a favourable cycle.

Such an outcome, namely JR companies becoming competitive in the transport market, can be evaluated as the most prominent effect of privatisation. In future however, when the motorway network is extended, the relative competitiveness of JR companies would reduce, and economic growth cannot be expected as rapidly as in the past. Therefore, it will become important for JR companies to think of creative ideas for increased efficiency in management, as well as sales plans, while focusing on security of increased volume of transport.

(b) Improvement of railway transport service

After division of JNR, it became possible to provide services that suited the actual conditions of the region, including improved train schedules and introduction of new carriages. From the viewpoint of maximizing railway characteristics, train speeds were increased and attitude of employees towards the customer, which is the very basic requirement, had been improved. Such positive efforts made by JR companies are worthy of evaluation.

On the other hand, improvement measures for congestion problems in metropolitan areas, and lack of facilities to assist the smooth movement of handicapped or aged people are lagging behind, and further efforts need to be made for resolution of these concerns.

(c) Reduction of burden to taxpayers

In the era of JNR, the amount of government subsidy exceeded the amount JNR paid as money equivalent to tax, and roughly 600 billion yen per year was borne by the nation. However, after privatisation the amount JR companies have been paying in tax exceeds the amount they receive as subsidy by 100 billion yen per year (Table 18). In this point, JNR reform has brought about an improvement in national finance, which in effect resulted in a reduction of burden to the nation.

Table 18 Amount of subsidy and tax paid by JNR/JRs

	Tax paid	Subsidy	Balance
1982	35.2	729.4	△694.2
1983	38.3	701.8	△663.5
1984	46.3	647.4	△601.1
1985	47.8	600.1	△552.3
1986	501.0	377.6	△327.5
1987	233.8	193.7	40.1
1988	264.8	211.0	53.8
1989	230.1	633.0	△402.9
1990	299.4	157.1	142.3
1991	444.3	108.2	336.1
1992	245.5	99.0	146.5
1993	252.4	91.7	160.7
1994	201.9	83.4	118.5

000,000,000yen

△ minus

Source: *Transport White Paper 1996*

(d) Reduction of employees

Carrying an excessive number of employees for the needs of the business was identified as the main business management problem of JNR. At the end of fiscal 1982 when the policy of division and privatisation of JNR was announced, the number of employees was 387,000. This was reduced to 199,000 by the beginning of fiscal 1987, when the JR companies were inaugurated, and to 189,000 by the end of fiscal 1995. As a consequence, productivity of all JR companies improved compared to the JNR era.

3.3. Assessment of each JR company

From the viewpoint of restoration of railway business, the major task now is to

aim at ultimate and complete privatisation of all JR companies, maintaining sound business management and enhancing the business foundation. Surveying the business situation after inauguration of JR, those of the three JR companies with metropolitan areas and Shinkansen lines in their business sphere was relatively favourable.

In the case of JR Hokkaido, a severe management environment was anticipated from the outset, and although special measures have been taken, such as not to succeed long-term debt and a Management Stabilisation Mechanism set up, the company has been facing austere conditions, partly due to low bank interest rates in recent years, causing a decline in management stabilisation fund investment revenue. JR Freight also is experiencing a severe financial environment, as competition with lorries and sea freight has become increasingly severe.

The business conditions of each JR company varies, but the common future task for all is to make further efforts for increased revenue from the core transport business, and reduce costs through improved efficiency, and at the same time, increase versatility of the business for strengthening of the business foundation.

(a) JR East, JR Central and JR West

While operating profit has increased, 25 per cent from 1987 to 1995, increases in operating costs were controlled, 12 per cent increase, and profit in fiscal 1995 on operating basis doubled compared to 1987. Meanwhile, the increase in current profit remained at 1.5 times compared to 1987, due to interest to be paid on long-term debt and on a new loan for the purchase of existing Shinkansen lines (Table 19). In addition, actions are required for easing congestion in metropolitan areas and installation of such facilities as elevators, which are aspects that lag behind.

Table 19 Operating profit & Current profit

		1987	1989	1991	1993	1995
JR East	Operating profit	296.4	281.1	354.8	416.5	383.7
	Current profit	76.6	103.4	108.0	101.5	102.1
JR Central	Operating profit	71.5	113.7	287.6	391.0	378.6
	Current profit	60.7	108.3	117.0	64.3	62.5
JR West	Operating profit	70.8	90.9	127.8	136.5	140.3
	Current profit	8.0	40.2	66.1	54.7	55.6
Total(Mainland)	Operating profit	438.7	485.7	770.2	944.0	902.6
	Current profit(A)	145.3	251.9	291.1	220.5	220.2
JR Hokkaido	Operating profit	△53.8	△52.7	△48.3	△45.3	△40.6
	Subsidy	49.8	49.5	49.0	46.9	37.8
	Current profit	△2.2	2.0	2.0	1.3	△1.4
JR Shikoku	Operating profit	△14.9	△11.6	△9.0	△11.3	△11.8
	Subsidy	15.1	15.1	14.2	13.5	10.5
	Current profit	10.8	6.1	7.1	2.4	△0.7
JR Kyusyu	Operating profit	△28.8	△28.7	△28.1	△26.7	△23.1
	Subsidy	28.3	28.2	27.9	25	21.5
	Current profit	1.5	3.8	4.2	1.4	0.7
Total(three isles)	Operating profit	△97.5	△93.0	△85.4	△83.3	△75.5
	Subsidy	93.2	92.8	91.1	82.9	69.8
	Current profit(B)	△3.0	10.1	13.3	4.3	△1.3
(A)+(B)		142.3	262.0	304.4	224.8	218.9

000,000,000yen

△ minus

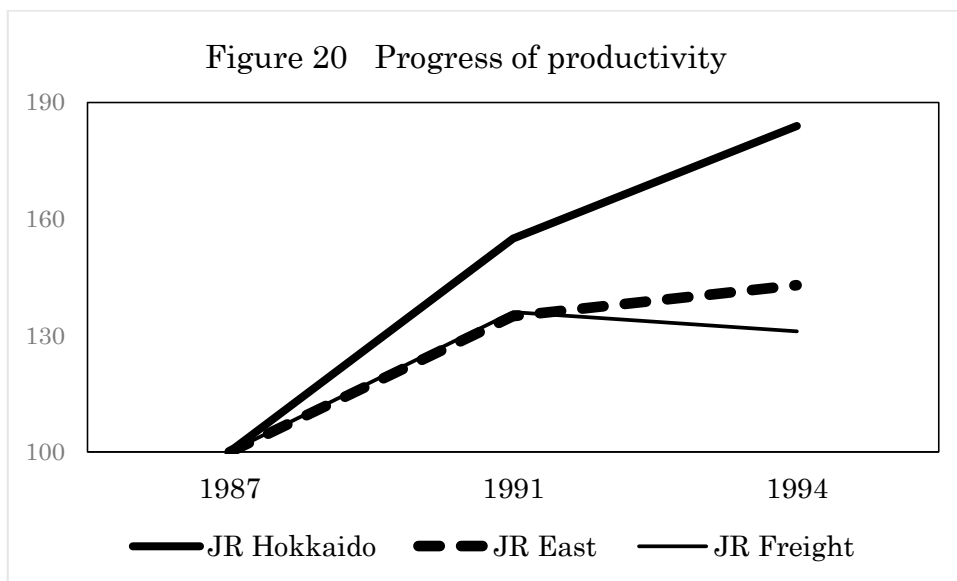
Source: Transport White Paper

1996

(b) Measures for JR Hokkaido, JR Shikoku and JR Kyushu are an urgent need

In the case of the above three companies for which a particularly severe business environment was anticipated, active measures were taken for rationalization, and as a result significant improvement was made in productivity (Figure 20). Although above JR companies managed to reduce deficit in operating profit and loss by 22billion yen in total compared to the outset, as Business Stabilisation Fund investment profit had fallen due to low bank interest in recent years, their business situation remains quite severe. Therefore, for achievement of full privatisation, it is essential for each of the companies to make the maximum effort for increased revenue, and rationalization of management.

Also, with more motorways opened within the business area of the three companies, increased competition with passenger cars and highway buses is anticipated. This means continuous effort has to be made for greater competitiveness, for example increased train services, train speeds, and improvement of carriages, in order to make railways more attractive.



Based on data of Ministry of Transport, Railway Bureau

(c) JR Freight

Efforts have been made continuously since the JNR era, for introduction of containers and increased service speeds through direct links. However, operating profit started to reduce after fiscal 1993, and the current loss lasted for three consecutive years, making business conditions severe.

From 1992, freight transport volume began to reduce on ton-km basis, with container freight in which the company had been specializing, also continued to decline until fiscal 1994. What is required in future is a fundamental review of the plan, and not only achieving the absolute rationalization of management, but also a transport plan with higher competitiveness in the logistics market needs to be cultivated in order to increase salability, by strengthening collaboration with forwarding companies on which JR Freight relies in the majority of cargo collection work.

3.4. Remaining policy issues

There are many remaining policy issues. Of these, the biggest is repayment of long-term debts. Also from the viewpoint of full privatisation, there is an urgent need to take action as a policy issue for enhancement of business foundation of JR Hokkaido, JR Shikoku, JR Kyushu and JR Freight.

(a) Clearance of long-term debt

Repayment of debts assigned to the three passenger transport companies in Honshu, namely the mainland, has been progressing smoothly, but the debt remaining with Settlement Corporation has increased, as sales of land and stocks are stagnating and land values have dropped significantly compared to their peak in 1990. Meanwhile, only a few saleable assets remain, and if this were left unresolved, an increase in the debt amount would be inevitable.

Current condition of long-term debt: ¥27.6 trillion as of beginning of 1996

Settlement Corporation had revenue of 11.3 trillion yen in total, for the nine years from 1987 to 1995. (Note: Includes transfer of TRTA equity from 1987 to 1990)

On the other hand however, total interest paid in the nine years reached 13.3 trillion yen. As a result, the long-term debt remaining with Settlement Corporation increased by 2.1 trillion yen, from original 25.5 trillion yen to 27.6 trillion yen.

Value of assets that can be allocated to repayment of debt of Settlement Corporation are as follows:

Land: Due to reduced value of real estate, the land remaining is evaluated at approx. 3 trillion yen, as of beginning of fiscal 1996.

JR stock: 6,690,000 shares (face value, 334.5 billion yen) after sale of JR East shares in 1993.

Credit to Railway Development Fund (debts inherited from former Shinkansen

Holding Corporation): Capital of approx. 1.9 trillion yen as of beginning of 1996.

Factor of increased debt: Burden of bank interest and payment of interest on pensions

Unless the Settlement Corporation gains revenue that exceeds the payments, namely the bank interest that incurred annually from long-term debt of JNR plus interest on pension-related loans, remaining debt of Corporation would accumulate by the amount of the shortfall. This is the situation as income tries to keep pace with bank interest.

In fact, the annual payment of bank interest reaches 1.3 to 1.5 trillion yen, and the Corporation's revenue exceeded payment and reduced the debt only twice in the past. Once in fiscal 1990 when the government accepted a debt of 0.9 trillion yen in exchange for the transfer of all equity of TRTA, and in 1993 when the Corporation gained 1.1 trillion yen income from the sale of two million shares of JR East (Figure 21, Table22).

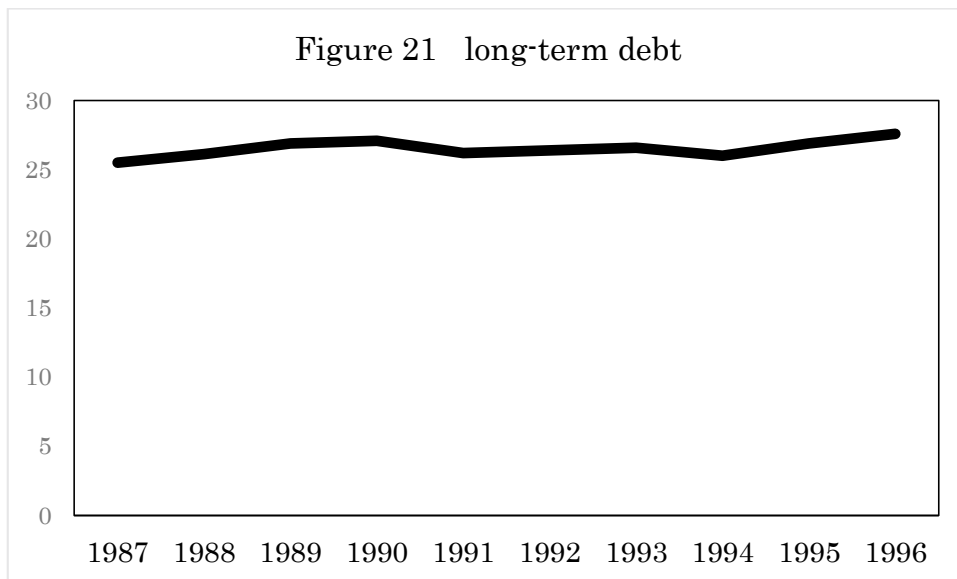


Table 22 Debt repaid by JNR Settlement Corporation

trillion yen			
1987	Debt total	25.5	
1987- 1995	Payment of bank interest	13.3	Interest etc.
	Revenue	11.3	Income from land and share sales etc.
	Shortfall in income	2.1	
1996	Debt total	27.6	

Source: Transport White Paper 1996

(b) Burden of pension

Special burden related to pensions: As a new burden from 1987 onward, there is pension liability. In the case of railway pensions, it was decided that this should be supported from fiscal 1990, by other pension systems. In this instance, Settlement Corporation paid from 1990 to 1996, 100 billion yen a year, 700 billion yen in total. JR also bore 22 billion yen, making a total of 154 billion yen, as a self-help effort.

Burden that accompanies amalgamation: It was decided that railway workers' pensions were to be amalgamated with government employees' pensions as of 4 September 1997. In amalgamation, Settlement Corporation bore as new debt, 0.8 trillion yen for the shortfall of current saving, as of the beginning of fiscal 1997.

(c) Action for debt reduction: Sale of assets and financial support

Revenue from sales of assets: Sale of assets such as land and shares were affected by the condition of the real estate and stock markets, and did not progress as planned, with land sales by bidding, frozen.

Subsidy: In order to prevent debt balance increases, a subsidy had been issued to Settlement Corporation. The total in the 10 years up to 1996 reached some 1.6 trillion yen.

Interest-free loan from national government: Debt of Settlement Corporation includes interest-free loan of 5.3388 trillion yen (beginning of fiscal 1996).

(d) Limitation of current scheme

Reduction of remaining assets and an increase in accumulated total of debt are inevitable. As described above, the debt repayment situation is struggling to keep pace with bank interest, and unless the Corporation secures its own revenue source exceeding 1.3 to 1.5 trillion yen a year, debt total would increase, and final amount of debt remaining would also increase.

Meanwhile, when income from own financial source equals or exceeds the bank interest, the debt stops increasing temporarily, but the value of assets remaining reduce after their sale, so the final amount of debt would still increase. Besides, should asset evaluation value reduce due to a fall in land prices, the final amount of debt would further increase.

When the assets are reducing, not only is it unrealistic to expect a significant reduction of debt, but an increase in accumulated total debt that remains, would now be unavoidable even when own financial source is appropriated.

(e) Need for establishment of fundamental measures

Delay in settlement of debt would increase burden to the nation, so establishment of fundamental measure is in urgent need. Therefore, the corporation is planning to make a serious study of concrete measures for debt settlement, which can obtain agreement of the nation.

4. Plan for full privatisation of JR Hokkaido, JR Shikoku and JR Freight

For JR Hokkaido, JR Shikoku and JR Kyushu, Business Stabilisation Fund was established to complement the operating loss by its investment income and maintain the business. However, under the recent low bank interest rates on savings, investment profit is reducing year on year, and it is not fully functioning as a countermeasure to compensate this loss.

In the case of JR Freight, adjustment is made to limit the railway line usage fee charged by passenger transport companies to the portion of additional costs only, principle of so-called avoidable costs. However, freight transport is more vulnerable to economic trends than passenger transport, and the business foundation is unstable.

In order to achieve full privatisation of these JR companies as occurred with the three companies in Honshu, which is the ultimate objective of the JNR reform,

it is necessary that each of the companies make an effort in sales and take action on the below-listed tasks in response to above described situation.⁵

Securing of capital investment fund: In the business scope of the above three companies, competition with other transport modes is becoming increasingly severe due to rapid progress of motorway networks, and further improvement in transport services, including increased speeds is required, in retaining competitiveness in intercity transport, which takes up more than half the revenue.

Furthermore, with intercity transport in metropolitan areas, improvement of single-line sections is essential, as these are bottlenecks to an increase in transport capacity, which is necessary in order to address requests from local government for eased road congestion.

However, considering the business condition of the three companies, it would not be easy for the companies to make investment in improvements with their own funds. Consequently, how to address these issues is a theme to tackle.

Assurance of investment profit of Business Stabilisation Fund: For the above three companies including JR Hokkaido, a Business Stabilisation fund was set up at the time of inauguration, in order to secure income to compensate for the expected operating loss. However, income from investment of this fund has been rapidly reducing due to recent low bank interest rate.

Because of this, their financial situation is deteriorating in spite of their full effort for business management, and this situation is expected to continue for some time. Since this is the factor of poor business condition of the three companies, another task is to find the way to secure operating profit of this Business Stabilisation Fund, and its improvement would enable early implementation of their full privatisation.

Action for issues of JR Freight: Clarification of the way to full privatisation. For achievement of JR Freight's full privatisation, revitalization and enhancement of the company's business in general is essential, with implementation of absolute rationalization of the company and enhanced sales ability through cooperation with logistics companies. At the same time, it is also necessary to reconfirm the significance of railway freight transport in Japan, and clarify the way for full privatisation of the company.

(See 5.2. Concerns of the three JR companies in rural areas, JR Kyushu listed on stock market)

5. Problems that became apparent

5.1. Occurrence of accidents

The Fukuchiyama line accident

There was a serious train accident on 25 April, 2005, for JR West. This accident occurred on the Fukuchiyama line that was operating in a suburb of Osaka, the second biggest city after Tokyo. It was a disastrous accident, with casualties of 107 dead and 562 injured. The death toll was the fourth largest for railway accidents that occurred after WWII.

Various safety measures had been taken on Japanese railways, so how could such a serious accident have occurred? Did the accident have any relation to privatisation? What became clear through investigations into the cause of the accident are as follows:

In June 2007, the government's Accidents Investigation Committee published its Railway Accident Report, which described the cause of the accident. In this report, the committee explained in detail how the accident happened, in their efforts to specify the cause, yet the cause had not been identified. The reason for this was that the driver of the train was killed, and it was impossible to clarify the exact cause any further

The train left Takarazuka station, in a suburb of Osaka, heading for Doshisha station, near a university, going through Osaka city centre. The accident occurred soon after 9:00 a.m. on a weekday, which meant that although the most congested time was over, there were still many people on the train, including university students who start slightly later. The train approached a curve at 116 km/h greatly exceeding the regulation speed of 70 km/h, and derailed as the train rolled to the outer side of the curve due to centrifugal forces.

The radius of the curve was 300 metres, so it was not a particularly sharp curve. There are many places with sharper curves in mountainous Japan. However, the train driver did over-run, namely failed to stop at the set position at an earlier station on that morning. Fearing that he might get a penalty from the company, the driver called the conductor and asked him to reduce the distance of over-run in his report. The conductor had meant to agree to the request, but he had to put the phone down before answering "Alright", as he received a complaint from a passenger regarding lateness while talking on the phone.

Because the phone was cut off by the conductor, the driver thought that the conductor had refused his request, and so he tapped the wireless conversation between the conductor and the company, reporting the over-run. There was

evidence of the driver taking notes of the conversation. All these things happened while the train was running, and it is possible that the driver was too preoccupied by the wireless conversation, and missed the timing for applying the brakes as he approached the curve.

The Accident Investigation Committee considered the above to be the cause of the accident. As the driver was dead, it was impossible to establish the facts, but the background of the accident based on this assumption is as described below.

The dead driver was young, 23 years old, and inexperienced with less than one year's experience. He did over-run at an earlier station, and he had made other errors in the past. However, according to the company, this driver's work record was not particularly inferior compared to other drivers.

The reason for the driver wishing to reduce the over-run distance could have been that he worried he might be moved from his driving job, his wages cut, or he might be sent on in-house retraining. The driver wanted to be promoted to a Shinkansen train driver, and hated the idea of getting his wages cut or sent on in-house training.

Then comes a problem of equipment, the Fukuchiyama line is a branch line and the accident occurred at the point where it joined the main line. The branch line joined the main line at almost a right angle, so the branch line had to take the curve, but here the branch down line was made to cross over the main line, so that the train that came from the main line to the branch line did not cross the train on the main line on a level plane.

For a branch down line to cross over the main line, there has to be a section where the branch line goes up the slope along the main line, and crosses the main line at the top of the slope, and there has to be two curves, one to the left and another to the right, in order to divide at a right angle.

However, since this is limited to the branch down line, and the train that left the station passes the curve before it gains speed, there was no chance of a problem occurring. Meanwhile, the branch up line does not cross the main line, but was led to the station on an easy curve of 600-metre radius on the level plane.

However in 1997, a new Tozai line, East-West line was added to the main line, allowing the branch line to get onto this line as well as the main line, and the station was renovated to allow passengers to change trains from one platform to another within the same station. At this time, the branch up line was renovated to cross over the main line as in the case of the down line, creating a 300-metre

radius curve on the up line.

As a 300-metre radius curve was added to the branch up line, the train approaching the curve at high speed had to reduce to 70 km/h just before the curve. There was an automatic train stop (ATS) system installed at the spot where the accident occurred, but it had no function to measure the speed of trains passing the spot.

In reflection, it is regrettable not to have had a speed detection device, but according to the company the ATS system was about to be changed for a new unit, and it was planned to change to a new model then. A similar accident caused by insufficient slow down when approaching a sharp curve from a high speed section, occurred in Spain also.

The section between Takarazuka and Osaka on the Fukuchiyama line is urban transport, which competes with the Hankyu Line that is private owned railway company. In the period of JNR, the Fukuchiyama line was not so competitive against the Hankyu line, but after privatisation, the Fukuchiyama line increased speed and became more competitive.

As the Tozai line was added to the main line and it became possible for the Fukuchiyama line to get onto the new line, its competitiveness increased further. Considering competition with the Hankyu line, JR West was cutting down time allowances from the train timetable, but stopped this policy after the accident. JNR in Osaka made less capital investment compared to JNR in Tokyo, and after privatisation, JR West increased capital investment for higher competitiveness.

The Accident Investigation Committee looked into the psychological aspect of the train driver, to see if he had a desire to commit suicide, but there was no such indication. This was different to the problem of an aeroplane pilot that had occurred recently.

Also, at the time of this accident, an express train going in the opposite direction was approaching, and had that train failed to stop, the scale of accident would have been far greater. This train made an emergency stop thanks to passersby who had witnessed the accident, and pressed the emergency button installed at the level crossing to stop the on-coming train.

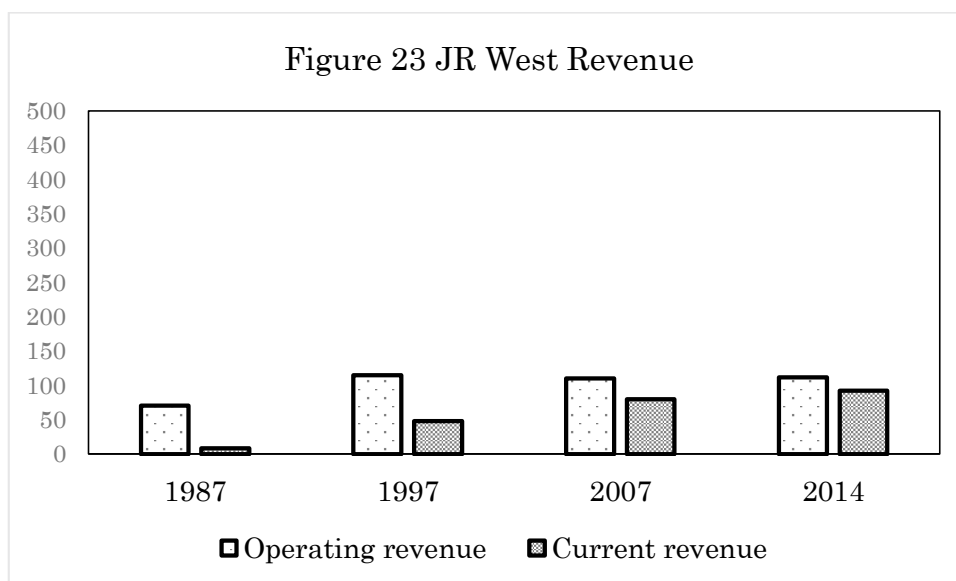
The Fukuchiyama line accident occurred because of an inexperienced driver, in addition to failures of both hardware and personnel that support train drivers. The reason for drivers being inexperienced was because JNR withheld recruitment for a while, and the number of inexperienced drivers increased after privatisation. As background information, the driver of the express approaching

the accident spot at that time was also young, at 22 years old.

The hardware problem was that the ATS and wireless functions remained at conventional levels in spite of trains being converted to cope with higher speeds and service frequency for increased competitiveness. This was because JR West, which was created as a result of division of JNR, rushed to increase speed and frequency of its urban transport services in order to enhance its business foundation, which was weaker than that of JR East and JR Central.

On the other hand, the management problem was that unsophisticated methods of managing labour-management conflicts that existed at the end of the JNR era, were still being applied. JNR as a public corporation, did not give managers the authority for setting wages, and managers not having sufficient power allowed the trade union to become more powerful.

So the trade union was not cooperative towards management, and JNR managed labour in a punitive way. Thus, problems that existed at the end of the JNR era lay at the root of the Fukuchiyama line accident. However, this does not mean that the accident was an inevitable result of privatisation. (Figure 23)



Unit: Billion yen, Source: *Railway Statistics*.

The Shigaraki line accident

In terms of railway accidents that occurred for JR West, there was another prior to Fukuchiyama line accident. This was a train crash that left 42 dead and 614 injured, which occurred at a point where JR West line joined the Shigaraki Kogen

Railway (SKR) line, on 14 May 1991 at 10:30 a.m. The fact that two major accidents occurred for JR West within a short period of time was abnormal in itself.

The Shigaraki line was one of the rural lines of JNR, but as passenger volume was too low, this line was separated from JNR based on the JNR reconstruction law enacted in 1980, and the management was transferred to SKR, a third sector. Shigaraki, a terminal of the Shigaraki line, was a town known for its pottery production, and an event was being held on that day. Special train services were being operated by JR West to carry passengers directly to this town. So a lot of passengers, 2.5 times set capacity, headed for the Shigaraki station of SKR.

SKR also was busy on that day, and was preparing to transport a large number of passengers in a different work arrangement. The Shigaraki line was a short single-track line, but in preparation for the event a passing place was created in the middle to allow up and down line trains to pass.

The situation just before the accident was as follows: Carrying a lot of passengers, the special train of JR entered the Shigaraki line two minutes behind schedule. Meanwhile, the up line train of SKR was waiting at Shigaraki station for the signal light to change to green before proceeding to the station where SKR connected to the JR line.

However, the signal at Shigaraki station would not change to green for a long time. Since congestion was anticipated on the day, SKR could not keep the train waiting in the station for too long, so decided to start the up line train 11 minutes behind schedule. This was against the law, but SKR staff thought that the safety device should have operated when one train entered the single line, to automatically change the light to red and make the down line train coming in the opposite direction wait at the passing place.

SKR had experienced the same problem of the signal light failing to change from red to green before. However, starting a train against a red light had caused no problem in the past as the safety device functioned, so the same measure was taken on that day. Railway signal lights function in a different system from those on roads, so it is unreasonable to blame SKR, assuming that all signal lights work in the same fashion

In this case, the light for down line train became red, but later changed to green, for reasons unknown. That was a serious problem. Seeing the light change from green to red, the JR special train driver thought it was strange that there was no up line train waiting at the passing place, but a frontal collision with SKR up line

train occurred immediately after.

There were few passengers on the up line train as it was going in the opposite direction to the event site, but 12 passengers and five railway staff, including the driver were killed. SKR used a light vehicle called a railcar, which has a similar structure to buses, so the damage caused by collision was severe.

Up to this point the fault was not down to JR West, but to SKR that started the train against a signal light. Here remains a mystery as to why the light at Shigaraki station did not change from red to green, and why the signal light for the down line at the passing place, which changed to red due to the safety device, had returned to green.

Regarding this point, the fact that JR West and SKR improved the signal light independently, and on the day of the accident also, SKR conducted repairs to the light, which might have had something to do with the problem, but the cause has not been fully identified. Normally, a signal light gives priority to the train on the main line entering the branch line. Otherwise, problems on the branch line could impact the main line, and the line condition could become chaotic.

In this case, it was natural for the JR train to proceed to passing place, but it was a mystery why the signal light at the passing place changed to green. It could be related to the repair performed by SKR, but the true cause has not been identified as the SKR worker responsible died in the accident. Not only with SKR, many railways for which closure was considered, were facing a shortage of technicians. Railway technicians in particular were difficult to find.

The passing place was created for the event, which was planned with the intention of JR West's cooperation with SKR for increasing revenue from its business operations, but it ended in disaster.

Had SKR remained with JNR, this line would have been abolished and replaced with a bus service based on JNR reconstruction law. Then there would have been no need to help SKR, and thus no chance of the accident occurring. How far should the railway business, which is designed for mass transport and mass production, include rural lines in its network? This became an issue to reconsider

JR East, JR Central and JR West are profitable railway companies, and these three companies are different to JR Hokkaido, JR Shikoku, JR Kyushu and JR Freight. However, the former three companies are different, too. Of the three companies, JR West has the lowest profitability. JR East is located in Tokyo, a large commuter market. There is a large demand where a railway can

demonstrate its characteristics. Moreover, as the population continues to gather in the Tokyo sphere, there is potential.

JR Central on the other hand, has Tokaido Shinkansen, namely a new trunk line, stretching 550 km linking Tokyo, Nagoya and Osaka. Industries are gathered here, and it is an industrial corridor. Demand for transport in this section is enormous and it is the largest transport market in Japan. Against this, JR West has the Osaka sphere which is a commuter market only, and demand from other cities is not so high. The market size is half that of Tokyo. Moreover, in the Osaka sphere, competitors of JR namely, private owned railway networks are well developed and the competitiveness of JR was low.

It is natural for JR West to take measures for enhanced competitiveness, as it had a weak business foundation and capital investment was insufficient since the JNR era. Although a remote possibility, one of the causes of Fukuchiyama line accident was that JR West was trying to strengthen its competitiveness in the railway business under a severe business environment, making it difficult to operate smoothly. A cause-and-effect relationship between active management policy and the accident cannot be proved, and one cannot say that the accident was avoidable if there was no such active management policy. Rather, it was a management-labour conflict and controlled capital investment at the end of the JNR era, that cast a shadow on JR companies after privatisation.

Comparison with EU

The characteristics of railway reform in Japan are division of the business by region. This was implemented by dividing the country into six blocks. Although setting of blocks was based on the size of regional division used at the time of privatising the electric power business in 1949, however not exactly in the same way.

Of the six blocks, the three blocks in Honshu or the mainland were considered to be commercially viable, and JR East, JR Central and JR West were allocated to each block. On the other hand, JR Hokkaido, JR Shikoku and JR Kyushu, to which these islands were allocated respectively, did not seem to be commercially viable, so the Business Stabilisation Fund was set up as a subsidising system.

Thus reform was implemented based on regional division of the railway business, but such division was made only for passenger services, and the freight service was left undivided and transferred to JR Freight. The proportion of passenger transport by rail is high in Japan, and rail freight transport was less

competitive compared to road.

In the process of railway reform, how the Freight Division should be handled was a source of contention for those who carried out the reform. Finally, it was decided that JR Freight was to use lines owned by the passenger lines for business, and pay the passenger companies for line usage. Said line usage fee was paid as an avoidable cost.

When categorised as an avoidable cost, the amount to be paid becomes significantly low compared to the full cost in a cost calculation. This was considered an actual subsidy to JR Freight. So, the company exists under the precondition of paying reduced line usage fees. If the company were to bear the full cost, JR Freight would not have been able to continue its business.

While railway reform in Japan was pursued by dividing the scope of business regionally, the Freight Division remained as one national company. In other words, infrastructure and operation were divided for freight transport, instead of dividing the company regionally. The infrastructure was owned by passenger transport companies, and JR Freight conducted its transport business while paying low line usage fees.

In fact, the Shinkansen also had different owners for infrastructure and operation at the outset of railway reform. The infrastructure was owned by a governmental organisation called Shinkansen Holding Corporation, and JR companies were assigned for operation. The Corporation permitted the three JR companies use of the infrastructure on payment of leasing fees. These fees collected from the three companies were allocated as an income source of the Business Stabilisation Fund set up to maintain the business of the other three JR companies in the three large islands, other than the mainland.

However, JR East, JR Central and JR West found this arrangement inconvenient as business management was restricted, and it was impossible to make sufficient capital investment in Shinkansen infrastructure. Therefore, it was decided for the three companies to buy off the Shinkansen lines. JR Central in particular, negotiated with the government to change from leasing to buy off, as the Shinkansen infrastructure was old and the company's Shinkansen usage frequency was high.

For existing Shinkansen lines including the Tokaido line, the wishes of the three JR companies in Honshu were approved, and Shinkansen infrastructures were bought off by each of the companies. This was a significant turnaround from the original idea of railway reform. This change from leasing to buy off did not change

the scale and usage of Shinkansen, and the government allotted the income for repayment of JNR debts, as well as for the Business Stabilisation Fund. Shinkansen Holding Corporation was dissolved as the infrastructure was sold to the three JR companies, and any remaining business was transferred to Japan Railway Construction, Transport and Technology Agency (JRTT), which is the later form of JNR Settlement Corporation.

In this way, while the three JR companies in Honshu bought off the existing infrastructure of Shinkansen, new Shinkansen lines constructed in other rural areas were owned by the government organisation JRTT, and operated by the relevant JR company by paying line usage fees.

In addition, consideration was given in setting line usage fees so that these would not become a burden to JR companies. This was because profitability of the Shinkansen in rural areas was low compared to Tokaido Shinkansen, and construction costs increased as a result of environmental countermeasures.

The second characteristic of railway reform was a policy of no competition between the railway companies, in contrast to EU countries. Including the franchise system in the UK, railway policy in Europe was to create competition between companies that operate rail transport. It was believed that railway services and rational management would improve, by creating competition.

Railways were in a fully competitive environment even left in their conventional form, because severe competition existed between rail, road, air and sea transport. Consequently, it was doubtful whether a new competitive market could be created, or even whether it was necessary. In Japan, although lack of discussion on introduction of a competition policy was a concern, railway performance was improving without promoting competition between operators.

Also, in EU where competition between operators was promoted, there has been no particular improvement in railway performance from the railway policy common to EU. However in Japan, infrastructure and operation were divided for freight transport and for Shinkansen in rural areas, without a competition policy being introduced. It was deemed to be an auxiliary policy in a form of division between infrastructure and operation.

5.2. Concerns of the three JR companies in rural areas

Limitations of Business Stabilisation Fund

In the case of railway reform in Japan, by dividing the railway network regionally, commercially viable fields and others were divided according to company. The

Business Stabilisation Fund was set up to support companies unlikely to be profitable, for their continued business operations. Profit generated by Shinkansen in Honshu was allotted as a fund source.

The Business Stabilisation Fund was set up anticipating it could earn interest at an extra-ordinarily high rate of 7.3%. One-tenth of the fund was transferred each year from the government to the three companies in the other three large islands, and accumulated by each company. An interest rate of 7.3% was guaranteed on the capital while it was held by the national government, but once it was transferred to the three JR companies, it was considered that the companies were responsible for its operation.

A high interest rate of 7.3% was calculated based on the actual interest paid by the bank during the bubble economy period, but when the bubble bust, the bank interest rate was reduced, first to 3% and then to 1%. The bank interest had been lowered by the time the JR companies were established, and at this stage it was anticipated that healthy operation of the fund in future would be difficult.

However in the first year, one-tenth of the capital was transferred to the JR companies, and the majority remained with the government, thus high interest remained assured, and it was not a serious problem. However, capital of the fund was transferred to the three JR companies year by year, and the amount transferred was left to each of the three JR companies, for autonomous investment on the market.

Reflecting market conditions, earning high interest on the fund became an unachievable dream, and it became impossible to function as a financial support of JR companies with returns from the fund. The amount of the Business Stabilisation Fund transferred to each of the three companies was: 68.22 billion yen to JR Hokkaido, 38.77 billion yen to JR Kyushu and 20.82 billion yen to JR Shikoku.

Accidents that continued in JR Hokkaido

In May 2011, an express train of JR Hokkaido derailed and caught fire. An express diesel train running at 110 km/h derailed in the section where there was a series of tunnels and caught fire, resulting in nearly 40 casualties. The cause of this accident was insufficient service performed on the carriages.

In JR Hokkaido, small accidents and malfunctions had occurred continuously from around 2010. In 2012, the Board of Audit stated that approximately 30% of train inspections performed by JR Hokkaido had not been up to the required

standard. Meanwhile, the Ministry of Land, Infrastructure and Transport announced that trains not operated or delayed due to malfunction of carriages or facilities was double that of other JR companies.

Then in September 2012, a JR Freight train running on JR Hokkaido tracks had derailed. In July 2013, an express train caught fire. Then in August of the same year, a freight train derailed because the ballast under the sleepers had been washed away by heavy rain, causing the rails to lift as the freight train passed, and it was derailed.

In April 2015, a rapid train running through an under-sea tunnel started to emit smoke, and many passengers had to evacuate by walking out of the tunnel. The passengers came to the surface by a cable car used for servicing. Later it became clear that rail maintenance had not been performed adequately, and there were many places where the two rails were not correctly aligned.

It was clearly abnormal for such accidents to occur continuously. The cause of this was the financial vulnerability of JR Hokkaido that could not afford to make sufficient investment in personnel for railway maintenance. At the same time, JR Hokkaido was facing severe competition with automobiles, and therefore was concentrating on strengthening competitiveness by increasing train speed. As a result of its efforts to increase train speed and operating ratio, with reduced maintenance frequency, excess load was placed on carriages and a series of accidents occurred.

Another factor identified was lack of communication between trade unions, although this could not have been the main cause. Then there was the mysterious incident of two presidents of JR Hokkaido committing suicide at the time of this series of accidents. However, any cause and effect relationship is unknown. The government decided to put JR Hokkaido under special audit, while at the same time providing financial support.

In June 2011, the government increased the Business Stabilisation Fund. At the same time, with JRTT's 220 billion yen interest-free loan to JR Hokkaido, the government bought JRTT bonds, 2.5% per year interest fixed for 10 years, to subsidise the interest rate as a supportive measure. This 5.5 billion yen per year interest on the bond provided revenue to JR Hokkaido.

In addition, a 60 billion yen subsidy and interest-free loan were provided by the government for renewal of the aged infrastructure. It is planned to provide another 120 billion yen support in 2015. All these support measures are effective as a temporally measure to overcome the emergency situation of JR Hokkaido that

had reached deadlock from a sound business perspective, and for securing safety. However, these cannot be the fundamental countermeasure for sustaining of the railway business by the Business Stabilisation Fund.

JR Hokkaido had been enhancing its competitiveness by increasing rapid train speeds and service frequency to increase revenue, but this was insufficient to carryout maintenance on track and trains, resulting in frequent accidents. None of those accidents were as serious as the Fukuchiyama line accident, but this situation had never occurred with conventional Japan railways.

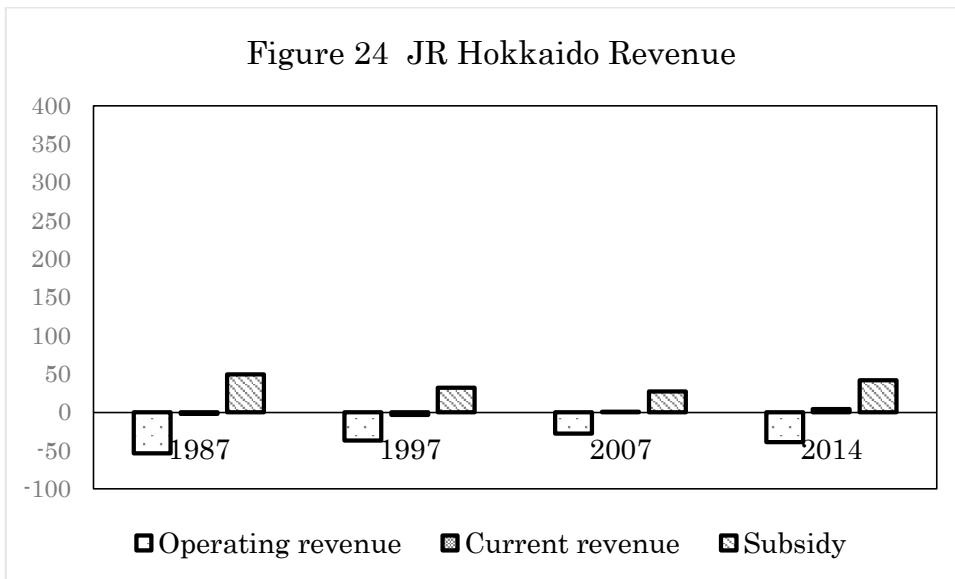
JR Hokkaido was compelled to reduce the speed of its rapid trains and also reduce service frequency, as an interim countermeasure to secure safety. Reducing train speed and service frequency immediately led to reduction of revenue, but not only that, the situation created a need for a fundamental review of the railway business.

It can be said that the railway business, which had been operated under the given conditions of the Business Stabilisation Fund, reached its limitation. An independent committee was set up in June 2015 in JR Hokkaido, to study a sustainable railways business plan in Hokkaido. The committee was to give priority to the immediate securing of safety, while pursuing priority selection and concentration as its basic policies.

Looking ahead however, it would be inevitable to abolish operations in low feasibility sections. JR Hokkaido is considering closure of one section, but there are lines with very few passengers in JR Hokkaido, and these lines will also have to be closed.

The population density in Hokkaido is low to begin with, and not suitable as a railway market. Demographically the population has been concentrated in Sapporo, while the population in other cities has been reducing. Having such a population distribution, it is difficult to have mass movement of population between two locations, a type of transport system most suitable to railways. In other words, there is no transport market where railway can be advantageous in Hokkaido, except for the Sapporo area.

How should a railway service be maintained in such geographical conditions? The active involvement of a local public entity is required. Once in the past, JR Hokkaido aimed at stock market listing, but the stock exchange considered that listing would be difficult, and currently there is no such plan. (Figure 24)



Unit: Billion yen, Source: *Railway Statistics*.

JR Shikoku in difficulty because of motorways

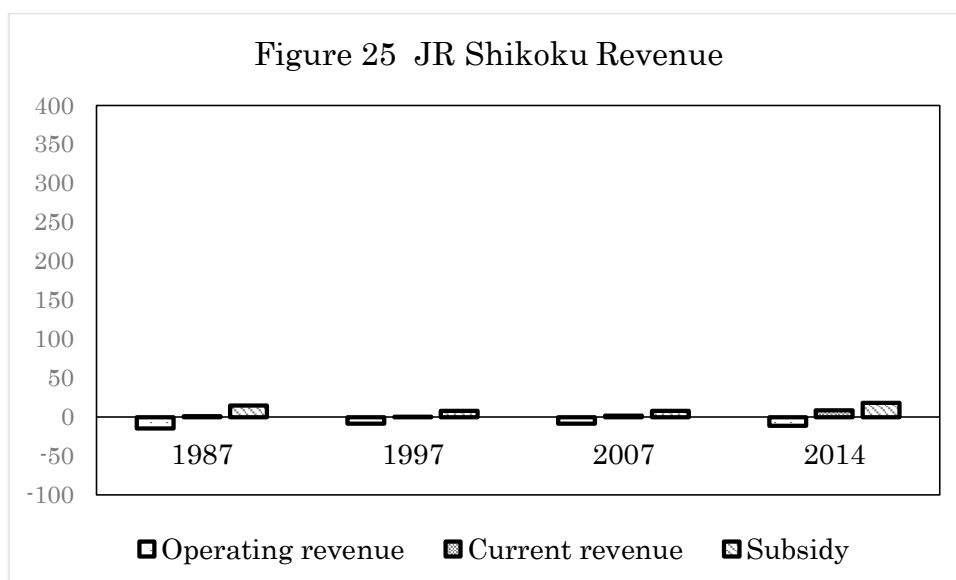
The business environment of JR Shikoku is becoming increasingly difficult. Population density in Shikoku is higher than Hokkaido, but its reduction started earlier than other regions. It is difficult to secure railway users in a community where the population is reducing rapidly. The passengers that JR Shikoku is transporting have reduced by 30% compared to when JR Shikoku started its operations, and revenue from the railway business reduced by 40%. However, by increasing management efficiency, the company has halved its current deficit.

In Shikoku, population reduction started earlier than in other areas, and in addition the motorway network has essentially been completed as it is now connected with Honshu. The motorway connects with Honshu via three over-sea bridges, and is more convenient than the railway that is linked with Honshu by only one line. There is no Shinkansen line in Shikoku, so competitiveness of the railway against the motorway is low.

In the period 2009 to 2011, the Democratic Party which was then in power, adopted a low-price policy for motorways, by charging 1,000 yen maximum for motorway use. A lot of rail users shifted to passenger cars at that time, and those rail users did not come back even after the reduced motorway toll was returned to its original level. The third problem was reduced bank interest rate on the Business Stabilisation Fund investment, which is the same situation as that facing JR Hokkaido. Recently however, the fund was increased as in the case of

Hokkaido, which saved the company from the risk of bankruptcy.

JR Shikoku is enthusiastic about operating highway coaches connecting Shikoku and Honshu, mainly in the Kansai area, which is the west part of Honshu. The highway coach business is showing a favourable balance. JR Shikoku introduced a pendulum system for carriages to increase the speed of conventional trains, but this did not sufficiently increase the company's competitiveness against motorways, so the company now wants to be connected with Honshu by Shinkansen. Currently, the company's business cannot be considered sufficiently established to become independent, and there is no plan for stock market listing. (Figure 25)



Unit: Billion yen, Source: *Railway Statistics*.

JR Kyushu listed on stock market

While JR Hokkaido had series of accidents and JR Shikoku was struggling in competition with motorways, the Ministry of Land, Infrastructure and Transportation (MLIT) assembled a report in February 2015 for the stock market listing of JR Kyushu. Since a company supported by the Business Stabilisation Fund cannot be listed, the government clarified its policy of handling the Business Stabilisation Fund, which stood at 387.7 billion yen.

The Ministry of Finance (MoF) stated that the Business Stabilisation Fund must be returned to the government if JR Kyushu were to be listed, but MLIT claimed that the fund need not be returned providing it was used to pay in advance for

Kyushu Shinkansen usage, repayment of the loan and capital investment. A revised JR company law based on this policy has already been passed, and JR Kyushu proceeded with full privatisation by listing on the stock market.

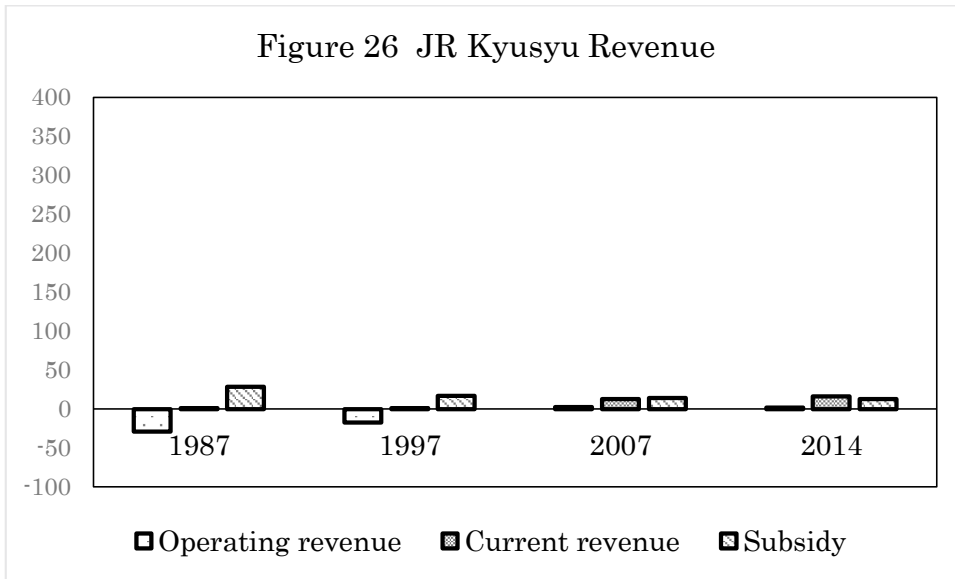
JR Kyushu is planning to be listed in the First Section of the Tokyo Stock Exchange within fiscal 2016, and JR TT is planning bulk sales of the JR Kyushu shares it owns. In terms of listing of JR companies, this would be the fourth to be listed since JR Central was listed in 1997, nearly 20 years ago.

Regarding the Business Stabilisation Fund, out of 387.7 billion yen more than half, or 220.5 billion yen will be allocated for bulk payment of the 30-year usage fee of the Shinkansen line. JR Kyushu which operates Kyushu Shinkansen is paying 10.2 billion yen annually, as a Shinkansen usage fee. In addition, the fund will be used to repay 80.0 billion yen debt, and a remaining 87.2 billion yen will be used for infrastructure equipment to maintain conventional lines. Unlike the three JR companies in Honshu, JR Kyushu will not buy off Shinkansen lines.

MoF that was requesting the Business Stabilisation Fund be returned, must have approved the plan, considering that if the Business Stabilisation Fund is used according to the plan and helps strengthen the financial base of JR Kyushu, corporate value would go up and the company's shares could be sold at a higher price. Listing on the stock market is what JR Kyushu wanted. MLIT is requesting JR Kyushu not to close local lines, in exchange for using the Business Stabilisation Fund.

As a target of the division and privatisation policy of JR companies, MLIT intends to promote listing of the three JR companies in the three isles, not main island, together with JR Freight. Compared to JR Hokkaido and JR Shikoku, JR Kyushu has a higher population area in northern Kyushu, and is geographically favourable, so Kyushu Shinkansen is a little competitive.

However, when it comes to the railway business in total, it is not in the position of quoting profit. JR companies are just about profitable when operations other than railways are included. The population in Kyushu is expected to reduce, including the northern part with its higher population. Under such circumstances, for the company to divest ownership of the national government to be fully privatised is a drastic decision of management. Full privatisation means that the company becomes financially independent and obtains higher freedom of management, but at the same time the company will no longer be entitled to substantial support from the government. (Figure 26)



Unit: Billion yen, Source: *Railway Statistics*.

5.3. Freight transport maintained by avoidable cost rule

Japan's domestic freight market is growing, and goods are carried mainly by lorries and in-shore coastal vessels. Market share ratio by distance zone between lorries and coastal vessels is relatively stable, with classification of light weight cargos of high-value-added for lorries, and heavy cargos for coastal vessels. In the case of railway freight transport, which held a high market share immediately after WWII, currently holds a 4% share on a tonne-kilometres basis.

Railway freight was once an important revenue source for JNR, but as construction of motorways progressed and the structure of domestic industry changed, the shift of freight to lorries increased and freight transport became a non-profitable business operation. Freight suitable for railways were heavy materials such as coal, limestone, cement and oil, and these favoured a standardised form of transport.

However, as coal mining in Japan came to an end, coal transport diminished, while at the same time high demand for limestone and cement reduced as the post-war reconstruction and high economic growth period came to an end. In addition, their transport shifted mostly to lorries, coastal vessels, and belt conveyers. The only large volume transport remaining with railways is imported oil to be carried inland from the ports.

In order to improve profitability of freight transport, JNR changed the traffic system from the type that transported cargo by wagon via the yard to the required

destination, to the type that transported directly between locations by containers and dedicated freight train. Freight transport speed was increased in this way, and manpower required for the yard reduced, thus improving the business balance, but this was insufficient to gain competitiveness against lorries.

JR Freight that inherited the new form of freight traffic operated a container and oil-dedicated transport service, with JR Freight playing the main role in container transport in the medium distance zone of 900 kms average. In terms of transporting cargos, coal, limestone and cement, which were the main cargos in the past, were replaced by food and industrial materials, paper and pulps, and door-to-door parcels.

On privatisation, supportive measures were taken by minimising the railway infrastructure owned by JR Freight in order to make the company viable as a business entity, and to offset the low profitability that is common with railway freight. Therefore transport is performed using the tracks owned by JR passenger transport companies, and the cost borne within the range of avoidable costs.

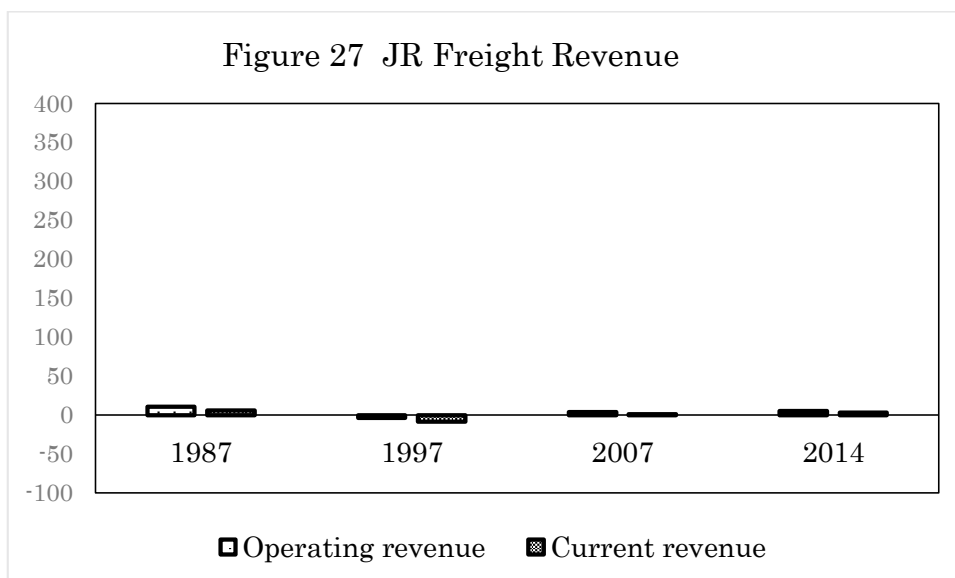
The avoidable costs rule may be permitted when the track owner is one of the three JR passenger transport companies in Honshu, but when the track owner is either JR Hokkaido or JR Shikoku, it is difficult to eliminate the feeling of unfairness as both sides are non-profit-making entities. Moreover, track usage charges rose for those sections that formally belonged to the three JR companies in Honshu, but had been separated from JR when proposed Shinkansen lines began their operation, to be transferred to a third sector company, so the increase is borne by Railway Construction, Transport and Technology Agency.

The domestic freight market has an industrial structure with a low barrier for new entry, which makes competition harder, so it is difficult for railway freight to recover all its costs. However, the government decided to retain railway freight by taking countermeasures, judging that leaving railway freight to the market mechanism and allowing railway freight to totally withdraw from the market, would increase the load burden and social criticism would be inevitable.

Since JR Freight uses the same tracks as passenger trains, freight train speed was increased so that it would not become an obstacle to passenger train operation. At the same time, investment was made on the Tokaido line, which did not have sufficient track capacity, to increase the hauling weight of trains. Although enabling sea container transport is an effective investment for enhanced competitiveness of rail freight, the modification has not been generally implemented as yet, due to clearance limits of railways in Japan being small.

The government eased controls on usage and transport in the 1990s, and forwarders became more powerful, making JR Freight, which had no forwarder function, weaker. JR Freight has to conduct the business under many restrictions, from both hard and soft aspects. Currently, the company has recruited a manager from an ocean shipping company, and is in the process of renewing the business under a new policy.

An expectation for modal shift from road to rail is socially increasing, but how far JR Freight can meet this expectation is in question. Balance of rail freight is improving, but currently there is no concrete outlook for the stock market listing of JR Freight. (Figure 27)



Unit: Billion yen, Source: *Railway Statistics*.

6. Direction of capital investment

6.1. Shinkansen line extending to rural areas

Construction of the proposed Shinkansen was decided based on the National Shinkansen Construction Law 1970, and covers the following five lines: Hokkaido Shinkansen, Tohoku Shinkansen, Hokuriku Shinkansen, Kyushu Shinkansen-Kagoshima and Kyushu Shinkansen-Nagasaki. Hokkaido Shinkansen is a completely new Shinkansen line planned to connect Aomori, the terminal of Tohoku Shinkansen, with Sapporo the central city of Hokkaido, through a tunnel. It is planned to start part operation in 2016.

With regard to Tohoku Shinkansen, service between Tokyo and Morioka has

long been in operation, and the extension to Aomori was started in 2010. Hokuriku Shinkansen is a line that links Tokyo and Osaka via the Japan Sea route, and its operation up to Nagano started in 1997, while operation to Kanazawa started in 2015. There is a section between Kanazawa and Osaka, the route of which has not yet been finalized. Kyushu Shinkansen-Kagoshima started full operation in 2011. However, Kyushu Shinkansen-Nagasaki that goes to Nagasaki branching off from Kyushu Shinkansen-Kagoshima, is still in the planning stage.

Construction of proposed Shinkansen was decided by law, but a considerable number of people living in cities are protesting. On the other hand, leading party members representing rural areas are actively promoting the plan, and the route was decided after making a number of changes, taking into consideration financial sources and construction conditions. In fact, it took fifteen years after the law was enacted, before a concrete plan was decided.

In December 1996, the government and leading parties agreed to acquire the finance from four sources; national public works expenditures, revenue from sales of Shinkansen lines, leasing fees and burden placed on local public entities. Revenue from the sale of Shinkansen lines is the government's revenue which is gained by selling infrastructure of Shinkansens to the three JR companies, including JR Central. Leasing fees are revenue obtained by Railway Construction, Transport and Technology Agency, leasing the proposed Shinkansen facility to relevant JR companies.

It was decided to determine priority order for their construction taking feasibility into consideration. JR companies wish to operate Shinkansen lines, but reject the vast costs that accompany the operation. The section of construction is decided each time by and between the government and the leading parties. Currently, construction of all the proposed lines has been started except for a part of the section of Hokuriku Shinkansen, the route of which has not yet been finalized.

The basic concept concerning construction of proposed Shinkansen is to avoid creating a financial burden on JR companies. This is because it is recognized that construction of local railway lines caused JNR to go bankrupt, so the government determined not to repeat this mistake.

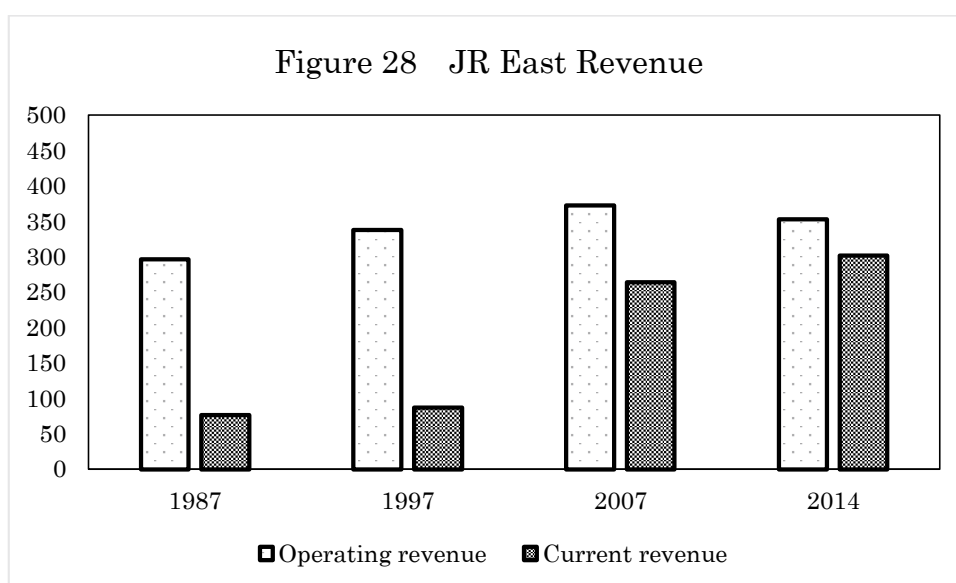
JR companies are to pay the Railway Construction, Transport and Technology Agency only the leasing fee for proposed Shinkansen, and would not buy off the infrastructure. Moreover, it was decided that the leasing fee was to be less than the amount of profit gained by each JR company. So costs, other than the leasing fee, were to be borne by the national government and local autonomous bodies,

at ratios of two-thirds and one-third, respectively.

Regarding the two-thirds to be borne by the national government, this is to be provided from funds raised by a new subsidy, public work expenditures, and through sales of existing Shinkansen lines; Tokaido, Sanyo, Tohoku and Joetsu to the three JR companies, which will be paid in instalments. Since the payment is in instalments, the government needs to prepare a loan for the amount not yet received, in order to construct the proposed Shinkansen. The remaining one-third that is to be borne by the local autonomous bodies is a subsidy from the national government as a public work expenditure.

As proposed Shinkansen line is constructed, the existing lines running in parallel with the Shinkansen would be taken out of JR companies' ownership and handed over to a local autonomous body. Therefore, construction of proposed Shinkansen became possible with the agreement of JR companies and the local autonomous body, not only for construction of proposed Shinkansen, but also separation of existing lines. Regarding the order of constructing proposed Shinkansen route, it was decided that the construction would begin with the route with the highest cost-effectiveness, to avoid pressure from Diet members representing the relevant region.

In terms of proposed Shinkansen, infrastructure is owned by the government corporation, and operation is performed by JR companies. However, entry of a new enterprise other than JR companies was not approved. This policy is quite different to that of EU. (Figure 28)



Unit: Billion yen, Source: *Railway Statistics*.

6.2. Major renovation of Tokaido Shinkansen

It is now half a century since Tokaido Shinkansen started operation. Due to high transport volume, number of services and high train speeds on Tokaido Shinkansen, work load and wear on tracks were also high, and major renovation was required on the line. In preparation for the renovation, the government created a special allotment system, and gave approval for JR Central to set aside funds of up to 500 billion yen over a period of fifteen years.

Then the great East Japan Earthquake occurred in 2011, and in addition another accident occurred, namely the ceiling of a motorway tunnel collapsed due to wear, which made old Shinkansen facilities also a concern. Therefore, the government enhanced countermeasures by reducing the saving period. A huge earthquake is anticipated in the area where the Tokaido Shinkansen is located, so the biggest task for JR Central became making sufficient preparation for a major earthquake.

6.3. Start construction of Central Shinkansen, Maglev

Central Shinkansen is the plan to link Tokyo and Osaka by Maglev. Transport between Tokyo and Osaka is the largest market in Japan, with the highest density of industry. The first Shinkansen constructed was Tokaido Shinkansen between Tokyo and Osaka. The railway between these two cities is the most important line with a large volume of transport, and has special significance in Japan.

However, in the period of high economic growth in Japan, there was concern that the capacity of Tokaido Shinkansen would become inadequate should demand in the area increase at the same rate. Moving away from a conventional railway system, JNR has been working on development of Maglev, which enables mass transport at high speed. Maglev which JNR has been developing is a system that magnetically raises the train and runs without steel wheels, a system that a lot of countries are developing.

Railways that use a linear motor as the drive system are already in use, but in development and application of Maglev that runs at high speed without steel wheels, JNR has outstanding technology. Since Maglev development reached the stage of application, JR Central decided to construct a new Maglev line between Tokyo and Nagoya.

Nagoya is a city located between Tokyo and Osaka, but slightly nearer to

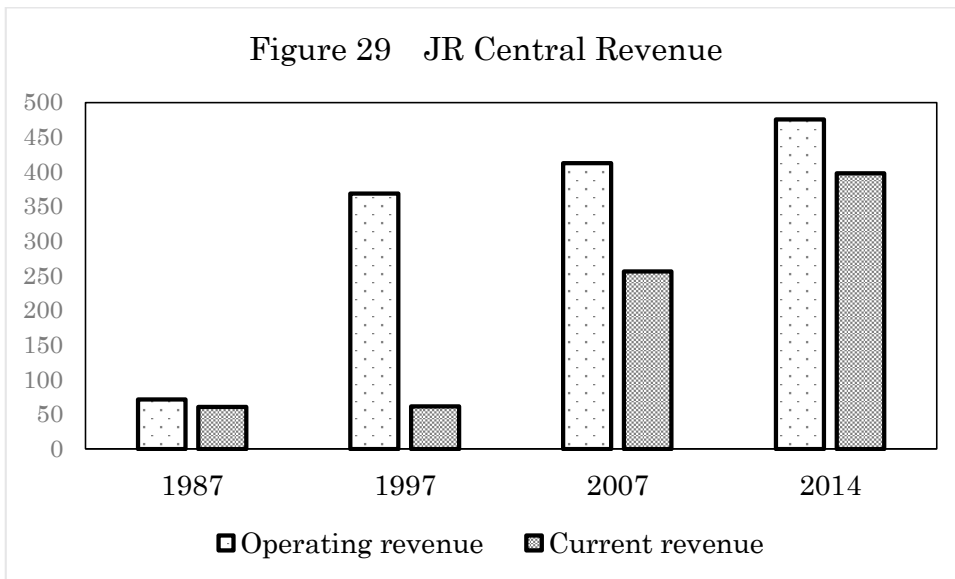
Osaka. The future plan is to extend Maglev up to Osaka. It will take 40 minutes from Tokyo to Nagoya by Maglev, which is a significant reduction in compared to the current time of 1 hour 40 minutes by Tokaido Shinkansen. The characteristics of Central Shinkansen are; firstly, that the Maglev to be constructed will be the world's first super high speed railway, and secondly, it will be constructed with private capital, for the first time in Japan.

In December 2007, JR Central announced that it would construct Central Shinkansen with Maglev between Tokyo and Nagoya, entirely with its own capital. The distance is 290 km, and total expense is estimated at 5.1 trillion yen. JR Central announced that the detailed method of fund raising had not yet been decided, but were planning to bring the company's debt level in eight years to the same level as 2007 when the plan was announced.

For one private company to make such a vast capital investment of over 5 trillion yen is an astonishing decision. The background to making this decision possible is the extremely high earning potential of Tokaido Shinkansen, located as it is in the largest transport market. The reason for adoption of the new Maglev technology is that the technology development that JNR has been involved in for a long time, has reached application level. In addition, the management judgement by Yoshiyuki Kasai opened the way for realisation.

Mr. Kasai is one of the three executives, together with Mr. Matsuda of JR East and Mr. Ide of JR West who promoted the privatisation while still inside JNR. JR Central requested government approval of Central Shinkansen as a new Shinkansen plan that conformed to National Shinkansen Establishment Law 1970, and the government approved the request in May 2011.

Central Shinkansen was not originally included in the proposed Shinkansen plan that the government had been pursuing. The proposed Shinkansen plan was made according to National Shinkansen Establishment Law 1970, for expansion of Shinkansen network to rural areas such as Kyushu, Hokkaido and Hokuriku. Based on the plan, the entire route planned in Kyushu and half the route planned in Hokuriku have started operation, while the part in Hokkaido is about to start operation. Central Shinkansen however, has a system that is fundamentally different from these conventional Shinkansen lines. (Figure 29)



Unit: Billion yen, Source: *Railway Statistic*.

6.4. Conflicts on capital investment

There had been two different concepts regarding construction of a railway network in Japan since before WWII. One was to put priority on construction of new lines, and put aside improvement of existing lines. Railway construction in Japan was pursued according to a plan, based on Railway Construction Law 1892. “According to a plan” implies that the railways were constructed in the order of lines with higher demand, and most of the trunk lines were completed in the days of Railway Construction Law 1892.

Tokaido line, the trunk line of trunk lines, was completed independently by Meiji government, Japan’s first modern government, in spite of a poor financial condition. The government and railway authority worked on construction and operation of Tokaido line with extraordinary determination, and the line was worthy of their efforts. The concept of putting priority on new line construction and leaving the improvement of conventional lines, came after most of the trunk lines had been constructed according to Railway Construction Law, with the idea that the new lines, namely local lines should be constructed first, leaving the improvement of Tokaido line, the major trunk line until later.

The opinion that priority should be given to construction of new lines, and the improvement of trunk lines could follow, was raised mainly by Diet members representing rural constituencies, so they were supported by residents in rural areas. The parties established after modernization of Japan, tried to get support

from their electorates by providing benefits from the construction of local lines. Construction of local lines was promoted by the ruling party, enacting Railway Construction Law 1922.

On the other hand, there was the opinion that construction of new lines should be put aside, and trunk lines improved. It was officials of the government and railway authority that raised this opinion, as they thought that considering profitability of the rail business, it was more important to strengthen the transport capacity of trunk lines, including Tokaido line, rather than expand the railway network to meet increasing demand. More precisely, the government thought of making the Tokaido line gauge the same as European tracks, which was the international standard, to increase capacity as Japan's railways were of a narrow gauge.

Since that time, the question of priority in capital investment followed; whether to expand the railway network by constructing local lines, or enhance capacity of trunk lines, mainly the Tokaido line. Railway Construction Law 1922 existed until privatisation in 1987, so construction of local lines continued in various places, albeit on a small scale. Post WWII was the time that abolishment of local lines was considered, so inconsistency became noticeable, for instance while constructing a new line in one area, a line in another area was being closed.

A lot of improvements were made to the Tokaido line, including construction of the Tan'nai tunnel in 1934, which was extremely difficult; thereby resulting in a dramatic improvement in Japan's tunnelling technology. Regarding construction of said tunnel, a children's book, "Story of Making a Tunnel" was published, a notable book that was read by a wide range of people over a long period. There were a number of people who were inspired by this book to become civil engineers.

During WWII, the idea of building a bullet train came up and construction of a new Tan'nai tunnel for the bullet train in parallel with the existing Tan'nai tunnel was started, but Japan lost the war before the tunnel could be completed. The bullet train idea was to put priority on improvement of trunk lines, as it was a plan to construct a new line in the international standard gauge in parallel with the existing Tokaido line, in order to fundamentally enhance the transport capability of the Tokaido line.

The bullet train plan was to extend the line from the Tokaido to the Sanyo line and reach Shimonoseki at the west end of Honshu. The plan then called for linking to the Korean railway network by ferry, eventually by under-sea tunnel to

the Korean Peninsula, finally to link to the south Manchuria railway. The Korean Peninsula was then a Japanese colony, and in the northeast of China adjacent to Korea was Manchuria, ruled Japan's puppet government.

JNR, which was established after the war faced an extreme shortage of transport capacity as it was using tracks that had been over-used during the war period, and further there was high demand for reconstruction of the country. When Japan rejoined the international community of nations and economic growth revived, as a member of the western world, the lack of transport capacity on the Tokaido line became apparent. JNR started work on the Tokaido Shinkansen project some 10 years after the end of the war, and in 1957 the Railway Technology Research Centre announced the Shinkansen plan.

There was a great response to the seminar on Shinkansen held by Railway Technology Research Centre at Yamaha Hall, Ginza, and public opinion in favour of construction of Shinkansen grew. In parallel with technology development by JNR, the World Bank approved an 80 million dollar loan at 5.75% annual interest, to be repaid over 20 years, but was deferred over the construction period of 3.5 years. For Japan that was exhausted after losing the war, the role played by the World Bank in construction of Shinkansen was enormous.

It was a period of rapid growth in motorway and aeroplane transport in Europe; so many people were sceptical about constructing Shinkansen by investing such a huge amount of money. However, as is widely known today, the success of Tokaido Shinkansen caused European countries to review the effectiveness of high speed trains. Due to differences in gauge compared to existing railway tracks, Shinkansen was constructed as a completely different system. This made Shinkansen costly, but as far as Tokaido Shinkansen was concerned, the construction cost was recovered early. Tokaido Shinkansen started operation in 1964.

Proposed Shinkansen project promoted by the government after the war, was to expand the Shinkansen network nationwide, and was an investment in the construction of new tracks. With the proposed Shinkansen project, it is inevitable that the more remote it became the lower the investment/earning ratio. Against that, Central Shinkansen promoted by JR Central is a capital investment for improvement of trunk lines such as the Tokaido line. As Japan's economy grew, concern that the capacity of Tokaido Shinkansen might become insufficient started to be more realistic, so the Central Shinkansen project began to draw attention.

When comparing the time when Tokaido Shinkansen was being constructed with today when construction of Central Shinkansen has been decided, the greatest difference is the demand increase ratio. Tokaido Shinkansen was constructed in the period of rapid economic growth, and demand was increasing rapidly. It was clear then that transport capacity of conventional Tokaido line would reach its limit at some point. Against this, the increase in demand today is not so high, and opinion is divided on whether there will ever be insufficient Tokaido Shinkansen capacity.

Under such circumstances, it should be noted that the party which decided to go ahead with construction of Central Shinkansen was not the government but JR Central, and the person who holds leadership is Mr. Kasai of JR Central. Such decision making was possible for the first time, as a result of privatisation.

With division together with privatisation, JR Central inherited the main artery, namely Tokaido Shinkansen. While the company holds the highly profitable Tokaido Shinkansen, it has few non-profitable lines, so profitability of the company in general is high. Consequently, the company wishes to spend its capital on future investments.

7. Outcome of JNR debts

Privatisation is a measure taken as a consequence of accumulation of long-term debt of JNR, as one important reason. A quarter of a century from privatisation, repayment of long-term debt of JNR is as described below. However before that, the concept of privatisation at that time must be explained. JNR's long-term debt reached 37.1 trillion yen at that point, and this amount included the cost of building a bridge that links Honshu and Shikoku, and the tunnel which links Honshu with Hokkaido. In other words, the debt included loans for activities other than railway business. In any case, the government stated that the total debt was 37.1 trillion yen.

This amount was allocated to the following three groups; Firstly, the JR companies, with 4.2 trillion yen to JR East, 500 billion yen to JR Central, 1.1 trillion yen to JR West and 100 billion yen to JR Freight. JR Hokkaido, JR Shikoku and JR Kyushu did not inherit the debt. The amount of debt allocated to each individual JR company was decided to be within the range that would not damage the sound management of each company.

The second party that inherited the debt was Shinkansen Holding Corporation, and amount was 5.7 trillion yen. This entity held infrastructure of Shinkansen, and by leasing it to the three JR companies in Honshu, it earned leasing fees which were then used for repayment of the debt. As a result of efforts made by each of the JR companies, the debt inherited had been completely repaid by 1996. The debt inherited by Shinkansen Holding Corporation is expected to be repaid by 2016.

The third organisation that inherited the debt was JNR Settlement Corporation, which inherited the vast sum of 25.5 trillion yen. The amount inherited by the three JR companies and Shinkansen Holding Corporation was determined based on certain criteria, but the amount inherited by JNR Settlement Corporation was just the amount remaining. Moreover, the amount allocated reached 69% of the entire long-term debt of JNR.

While repayment of the debt inherited by the three JR companies and Shinkansen Holding Corporation progressed smoothly, the debt inherited by JNR Settlement Corporation increased from the original 25.5 trillion yen to 28.3 trillion yen. The cause of this was firstly that the Corporation decided not to sell land as land prices had soared, and did not sell shares as the stock price had dropped heavily. It may sound strange not to sell land because the price had risen excessively, but this was due to the bubble economy affecting the real estate prices, and the government feared that further supplies of land might exasperate the market.

As the debt inherited by JNR Settlement Corporation increased from 25.5 trillion yen to 28.3 trillion yen, the government took further countermeasures in 1998. The breakdown of the debt inherited by Settlement Corporation was: 16.1 trillion yen loan with interest, 8.1 trillion yen interest-free loan and 4.1 trillion yen for future expenses on pensions and transferred to the welfare pension fund.

Of these, the 16 trillion yen loan with interest was transferred to the government's general account, and 8.1 trillion yen interest-free loan was waved by the government. Thus the majority of JNR's long-term loans were diminished by transferring to the nation. As for the 4.1 trillion yen, namely future expenses of the pension and transfer to welfare pension fund, 3.9 trillion yen, or the majority was inherited by Railway Construction, Transport and Technology Agency, that later became JNR Settlement Corporation. Of the amount transferred to the welfare pension fund, 200 billion yen was earmarked to be borne by JRs.

Japan's economy that once had a high bank interest rate of 7.3% due to

government policy, went through a long period of recession, and at the time of JR privatisation, bank interest had fallen to an extraordinarily low level, virtually nil. It is Business Stabilisation Fund that suffers when such a low interest rate period continues. Since the objective of said fund is to compensate for the shortfall in revenues of JR Hokkaido, JR Shikoku and JR Kyushu, these three JR companies cannot continue their business when investments cannot earn much interest.

The government enacted a new law in 2011 to increase the amount of said fund, to subsidize capital investment. Specifically, the fund was increased by 220 billion yen for JR Hokkaido and 140 billion yen for JR Shikoku. No fund was added for JR Kyushu, as the company had announced its plan to be listed on the stock market.

While the investment profit of Business Stabilisation Fund was reducing, the government set up a capital investment subsidy of 60 billion yen, 40 billion yen, 50 billion yen, for JR Hokkaido, JR Shikoku and JR Kyushu, respectively. Meanwhile, a total of 89 billion yen was prepared as subsidy for JR Freight.

The government could take these support measures due to surplus funds generated by Railway construction, Transport and Technology Agency JR TT, through earnings from the sale of shares at the time of listing JR East, JR Central and JR West, as well as land inherited from JNR, and sales of the Shinkansen infrastructure to JR East, JR Central and JR West.

The objective of the support provided in 2011 was to save the three JR companies in the three islands after the mainland, because their Business Stabilisation Fund investment was producing hardly any income, and also to help capital investment by JR Freight for increased competitiveness, as the company's business was declining. Within the framework of railway reform, effectiveness of the Business Stabilisation Fund was most seriously affected by a low bank interest rate.

Conclusion

Regarding the trunk lines in Japan, their construction and the operation can be divided into four periods: First, a period of 34 years from 1872 when the railway business started, until 1906 when it was nationalised. In this period, railways were constructed and operated by the government, the former ruling class and new entrepreneurs. The government was facing financial problems during that period,

and railways were constructed using the money of the former ruling class and emerging investors, but the government played a major role in the operation of the business.

The second period was the 43 years from 1906 when the railway business was nationalised, until 1949 soon after Japan's defeat in WWII. It was the period when trunk lines became a government monopoly and the railway network was fully developed. Capital investments in railways were made from the earnings of the railway business. For modern Japanese governments, the compensation obtained from victory in the Japan-China war, created the opportunity to establish a financial base. This was the period when heavy industry expanded in the Japanese economy, and the role of railways increased in importance. However, the last eight years of this period fell in the middle, and soon after WWII, so the effective period was the 35 years prior to the war.

The third period was the 38 years from 1949 when the government formed a public corporation as part of its post-war reforms, until 1987 when the company was privatised. This was a period when Japan's economy concentrated on recovery from the devastation of the war and subsequent growth, and the importance of railways increased considerably. However, automobile and aeroplane growth was rapid, and the environment of the transport market changed from a railway monopoly to competition with other forms of transport.

The fourth period was the 28 years from 1987 when JNR was privatised, up to the present. JNR became private companies divided by region, each company with strong characteristics.

In summary, the first period was the time when government business coexisted with many private companies, while the second period was the time when railway business was unified as one government business, while the third period was the time when revision was made to the government business, and public corporations were formed. Finally in the fourth period, the corporation was divided to become private companies, and the profitable companies became joint-stock companies, not just in their form, but also in terms of ownership.

What one should notice is that the first three periods cover around 35 years, while the fourth period in the present system is approaching 35 years. It is not my intention to discuss life expectancy theory, but looking at the situation objectively, problems of the present system are becoming apparent, and it is about the time to prepare for the next reform. The framework of railway reform, such as leasing of Shinkansen and Business Stabilisation Fund has already collapsed, and the

structure following privatisation is maintained with various life-support measures. It is unlikely that such conditions can continue for much longer.

There is a considerable difference in economic growth by region, which is also variable. That means that each JR company will probably enhance its characteristics, as each individual company is conducting business within its allocated market. Can companies with different capabilities and characteristics maintain a national network jointly? If this is possible, what kind of policy would be required?

What one has to pay attention to is the form of network. Assuming the stage when the national network of Shinkansen has been established to a certain extent, and the new trunk line of Maglev started operation, a commercially viable range of railway business needs to be considered. When Shinkansen network is complete and motorways and airport networks have progressed, is there a rational reason for local lines to be maintained by duplicating the conventional network? There appear to be areas for revision of regional division.

Appendix

Figure 30 Passenger km index - main isle

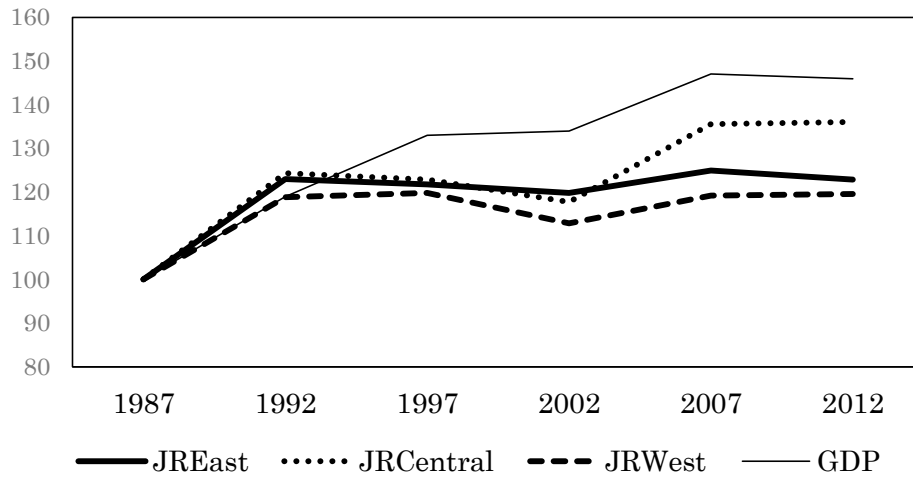


Figure 31 Passenger km index - three isles

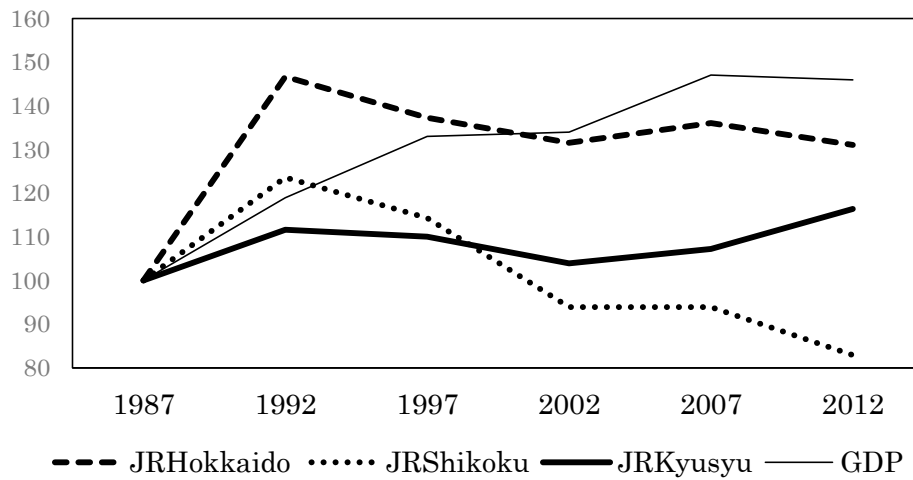


Table 32 Operating profit & Current profit

		1995	2000	2005	2010	2014
JR East	Operating profit	383.7	288.7	342.4	281.0	352.6
	Current profit	102.1	97.8	220.7	195.0	301.5
JR Central	Operating profit	378.6	324.7	383.7	325.4	475.4
	Current profit	62.5	65.1	195.3	207.5	397.7
JR West	Operating profit	140.3	97.0	108.9	75.8	112.0
	Current profit	55.6	43.4	75.9	48.5	92.1
Total (Main isle)	Operating profit	902.6	710.4	835.0	682.2	940.0
	Current profit(A)	220.2	206.3	491.9	451.0	791.3
JR Hokkaido	Operating profit	△40.6	△29.9	△30.7	△25.9	△38.9
	Subsidy	37.8	29.2	29.0	24.0	41.8
	Current profit	△1.4	0.4	0.2	△0.4	4.3
JR Shikoku	Operating profit	△11.8	△9.0	△9.5	△9.0	△11.2
	Subsidy	10.5	9.6	9.1	7.4	18.1
	Current profit	△0.7	0.8	0.9	△1.5	9.3
JR Kyusyu	Operating profit	△23.1	△12.3	1.5	△3.1	1.8
	Subsidy	21.5	17.0	14.3	11.1	12.5
	Current profit	0.7	5.6	9.9	4.6	16.3
Total (Three isles)	Operating profit	△75.5	△51.2	△38.7	△38.0	△48.3
	Subsidy	69.8	55.8	52.4	42.5	72.4
	Current profit(B)	△1.3	6.8	11.0	2.7	29.9
(A)+(B)		218.9	213.1	502.9	453.7	821.2
JR Freight	Operating profit	△3.0	0.4	3.5	3.7	5.2
	Current profit(C)	△8.9	△2.6	1.4	3.0	3.2
(A)+(B)+(C)		210.0	210.5	504.3	456.7	824.4

000,000,000yen

△ minus

Chronology

JR Hokkaido

- 1987 Founding of the company
- 1988 Opening of Seikan Tunnel between Honshu and Hokkaido
- 1990 Beginning of 130 km/h express train operation
- 1991 Bubble economy burst
- 1992 Inauguration of airport access line in Sapporo
- 1993-1994 Occurrence of earthquake off south western and eastern Hokkaido
- 1995 Closing of Shinmei rural line
- 1996 Fares increased
- 1997 Bankruptcy of largest bank in Hokkaido
- 2000 Eruption of Mount Usu
- 2001 Start of population decline in Hokkaido
- 2002 Beginning of economic expansion in Japan
- 2008 Bankruptcy of Lehman Brothers
- 2011 Occurrence of earthquake off East Japan
- 2011-2015 Occurrence of several train accidents
- 2013 Speed and number of express train services reduced as safety measure

JR East

- 1987 Founding of the company
- 1991 Purchase of Shinkansen lines
 - Bubble economy burst
- 1992 Commencement of services on Yamagata Shinkansen
- 1992 Listing of shares
- 1995 Introduction of short distance Shinkansen commuter trains
- 1996-1998 Extension and opening new commuter train services in Tokyo
- 1997 Commencement of services on Nagano and Akita Shinkansen lines
- 1999 Acceptance of extra burden of JNR debt
- 2001 Introduction of IC card
 - Achievement of full privatisation
- 2002 Beginning of economic expansion in Japan
- 2004 Occurrence of earthquake off Niigata
- 2005 Beginning of nationwide population decline
- 2008 Bankruptcy of Lehman Brothers

2011 Occurrence of earthquake off East Japan
2015 Commencement of services on Hokuriku Shinkansen for Kanazawa

JR Central

1987 Founding of the company
1991 Purchase of Tokaido Shinkansen
 Bubble economy burst
1992 Debut of “Nozomi” fast express trains on Tokaido Shinkansen
1996 Completion of Maglev test track
1997 Listing of shares
1999 Acceptance of extra burden of JNR debt
2001 Achievement of full privatisation
2002 Beginning of economic expansion in Japan
2005 Beginning of nationwide population decline
2007 Announcement of Maglev line construction by JR Central
2008 Bankruptcy of Lehman Brothers
2014 Start of Maglev line construction between Tokyo and Nagoya

JR West

1987 Founding of the company
1988 Opening of Seto Bridge between Honshu and Shikoku
1991 Purchase of Sanyo Shinkansen
 Occurrence of accident on Shigaraki Kogen Railway
 Bubble economy burst
1994 Opening of Kansai International Airport access line
1995 Occurrence of earthquake off Hanshin-Awaji
1996 Listing of shares
1997 First operation of east-west line in Osaka
1999 Acceptance of additional burden of JNR debt
2000 Beginning of 130 km/h rapid commuter train services
2001 Achievement of full privatisation
2002 Beginning of economic expansion in Japan
2003 Introduction of IC card
2004 Achievement of full privatisation
2005 Occurrence of accident on Fukuchiyama line
 Beginning of nationwide population decline
2008 Bankruptcy of Lehman Brothers
2015 Commencement of services on Hokuriku Shinkansen from Kanazawa to Tokyo, in

conjunction with JR East

JR Shikoku

- 1986 Beginning of decline in Shikoku population
- 1987 Founding of the company
- 1988 Opening of Seto Bridge between Honshu and Shikoku
- 1989 Introduction of pendulum system for express trains
- 1991 Bubble economy burst
- 1996 Fares increased
- 1998 Debut of new sleeper trains to Tokyo
- 1998-2012 Completion of highway network in Shikoku linking Honshu
- 1999 Enhancement on JR Shikoku highway bus services linking Osaka-Kyoto region
- 2002 Beginning of economic expansion in Japan
- 2008 Bankruptcy of Lehman Brothers
- 2013 Start of battery operated train trials

JR Kyushu

- 1987 Founding of the company
- 1990 Beginning of 130 km/h express train operation
- 1991 Opening of international sea link to Korea
 - Bubble economy burst
- 1996 Fares increased
- 2002 Beginning of Kyushu population decline
 - Beginning of economic expansion in Japan
- 2004 Commencement of services on Kyushu Shinkansen
- 2008 Bankruptcy of Lehman Brothers
- 2013 Beginning of luxury sightseeing train services
- 2015 Preparation for listing of shares

JR Freight

- 1987 Founding of the company
- 1988 Opening of Seikan Tunnel between Honshu and Hokkaido
 - Opening of Seto Bridge between Honshu and Shikoku
- 1989-1992 Debut of new locomotives and container wagons
- 1991 Bubble economy burst
- 1993 Improvement of freight traffic capacity on Tokaido old line
- 1995 Occurrence of earthquake off Hanshin-Awaji
 - Beginning of sea container transportation
- 2000 Debut of largest locomotive, EH500

- 2002 Beginning of economic expansion in Japan
- 2008 Bankruptcy of Lehman Brothers
- 2011 Occurrence of earthquake off East Japan
 - Beginning of oil and debris transport in disaster areas
- 2013 Appointment of new chairman, former manager of steam ships company

JNR Settlement Corporation

- 1987 Founding of the corporation
 - Soaring land price in Tokyo
- 1990 Suspension of land sales by government
- 1991 Bubble economy burst
- 1992 Listing of shares for JR East
- 1993 Decline of land price in Tokyo
- 1995 Policy interest rate set at 0.5%
- 1996 Listing of shares for JR West
- 1997 Listing of shares for JR Central
- 1998 Liquidation

Japan Railway Construction Public Corporation JRCC

- 1964 Founding of the corporation by Government and JNR
- 1998 Taking over from JNR Settlement Corporation
- 2002 Beginning of economic expansion in Japan
- 2003 Liquidation

Japan Railway Construction, Transport and Technology Agency JRTT

- 2003 Founding of the corporation
 - Taking over from Japan Railway Construction Public Corporation JRCC, and Corporation for Advanced Technology CATT, as successor to Shinkansen Holding Corporation
- 2008 Bankruptcy of Lehman Brothers
 - Policy interest rate set at 0.1%
- 2015 Preparation for listing of shares jointly with JR Kyushu

Shinkansen Holding Public Corporation

- 1987 Founding of the corporation
- 1991 Liquidation

Notes

- ¹ See ISHIKAWA, T., IMASHIRO, M., *The Privatisation of Japanese National Railways, Railway Management, Market and Policy*, 1998. Athlone Press.
- ² Transport White Paper 1996, pp.43-64
- ³ *ibid*, pp.67-80
- ⁴ *ibid*, pp.87-104
- ⁵ IMASHIRO, M., *The Experience of Railway Privatisation in Japan*, 2003. Management Journal No.6, pp.91-105

Reference

- JR Hokkaido, *Resent ten years of JR Hokkaido*, 1997.
JR Hokkaido, *Twenty years history of JR Hokkaido*, 2007.
JR East, *East Japan Railway company twenty years history*, 2007.
JR Central, *Central Japan Railway company twenty years history*, 2007.
JR West, *Ten years history of JR West*, 1997.
JR Shikoku, *Ten years history of JR Shikoku*, 1997.
JR Shikoku, *Twenty years history of JR Shikoku*, 2007
JR Kyushu, *JR Kyushu ten years history*, 1997.
JR Kyushu, *JR Kyushu twenty years history*, 2007.
JR Freight, *Five years history of JR Freight*, 1992.
JR Freight, *Fifteen years history of JR Freight*, 2003.
JR Freight, *History of Freight railways in a hundred and thirty years*, 2007.
JR TT, *Twenty five years history of JNR settlement affairs*, 2012.