

# Japanese Urban Railways, Markets, Capital Formation and Fares—Private Railways

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This article describes various factors affecting the operation of private railways in major Japanese cities and some of the changes in urban rail transit. I will focus on the urban rail transit market, capital formation and fares as factors for consideration when managing a private railway. The role of Japanese private railways in urban transit is quite unique in the world and I will examine the terms and conditions of private railway management that have made private railways so important in Japan's urban transit.

## Why Are Japanese Urban Trains So Crowded?

Why are Tokyo's trains so crowded with commuters and students every weekday morning? I imagine everyone visiting Tokyo must ask this question when taking a rush-hour train. There are various answers and all are valid.

Mainly, Tokyo is just too big—there are too many people travelling into the city at the same time every day. Consequently, we need to find ways to prevent more people from travelling into Tokyo, such as policies that encourage off-peak use. Another different solution is to increase capacity by running trains more frequently and at faster speeds. We have had this problem of rush-hour overcrowding for a long time, but why can't we solve it?

In an attempt to shorten journey times, it is true that trains are now longer and longer and run more frequently with through operations on lines of different companies. However, the most effective way to increase the capacity of services to the inner city requires a more radical approach of double- and quadruple-tracking existing lines, as well as investment in new lines.

Why has there been so little of this type of investment? The answer is because double- and quadruple-tracking as well as new construction requires massive capital due to the still phenomenally high

price of land in Japan's cities plus very long construction terms due to opposition from local residents. (Since private railway companies have also been major property developers, inflated land prices have been a double-edged sword for their business, meaning real-estate businesses performing precedence acquisition of land will yield the windfall profits, while railway businesses planning to purchase land increase the large amount of burdens, causing investment impossible.) For many private railway operators, major capital investment in new track infrastructure could threaten their survival so they are

naturally very reluctant about making these large investments. Their failure to do so has slowed the incentive towards making trains less congested.

A partial solution has been to make smaller investments in longer platforms and improved signalling systems for handling longer trains at shorter headways of 3 minutes or less.

## Vital Role of Private Railways in Urban Transport

Many urban transit systems in Europe are financed through government investment



Tobu Railway's Isezaki Line at Gotanno Station

(T. Suga)



Keihan Electric Railway's line between Doi and Takii stations

(Railman Photo)

and managed by a public authority. Japan is in stark contrast to this idea—Japanese private railway companies are expected to be self-supporting and receive no subsidies or other public assistance for operations. There are subsidies for building new lines and grade separation, but these are to assist with construction costs, not to subsidize operations.

Japan's private railways are viewed as profit-making businesses and are expected to pay corporate taxes on income and pay dividends to shareholders. There are three reasons why they are in a good position to make profits.

First, urban railway companies made key investments in the early days. For example, although Tokyo, Osaka and other large Japanese cities had good railway networks by the 1920s, the investments were not based on a master transport plan, but simply reflected a strong desire by private capital to make long-term profits from railways. Many railway investments did not produce immediate returns because of the Great Depression in the late 1920s. But the increasing demand created by the high-economic growth period in the 1950s and 1960s generated more long-term returns than ever expected. The negative side of increasing demand is rush-hour congestion, but at least railways could maintain a dominant role in urban transport while the road system remained underdeveloped.

Second, rapid economic growth coincided with migration of population to the cities as development offered more better-paying jobs. Urban migration created a natural increase in commuter rail passengers who willingly endured long journeys on overcrowded trains each morning. These long-suffering commuters formed the basis of Japan's strong economic growth in this period. There was some investment in infrastructure improvements and most of the surviving prewar tracks were used effectively.

Third, most private railways have diversified from railway operations into a

wide range of other business areas and have formed huge group companies. Development of trackside real estate has always been attractive as a non-rail profit centre and was considered a risk-free asset while urban land values spiralled from the 1950s to early 1990s. The background to this strategy is that under the corporate tax system, realized net profits are taxable while unrealized profits are not. Companies skillfully used this to expand their capital by converting the fruits of economic growth into internal reserves as unrealized profit (latent profit). Although this strategy was effective when asset values were increasing, it is unclear whether it will be successful in the future. Although, the collapse of land values over the last 10 years has highlighted the risks, the real-estate sector still remains a dominant area where private railway companies might make non-train profits.

### Formative Years of Urban Rail Networks

Some background to the construction of railway lines in and around Tokyo, and

the Keihanshin region of Kyoto, Osaka and Kobe is useful in understanding the present circumstances.

Table 1 shows construction of lines by the government railways peaked between 1872 when Japan's first railway line was opened and the first decade of the 20th century. This was not the case for private railways. The length of private lines in Greater Tokyo (Tokyo and the neighbouring three prefectures) grew considerably between 1912 and 1926 and even more so (by 316.2 km) during the the first decade of the Showa period (1926–35). Growth then slowed to just 256.8 km of new tracks from 1936 to 1989. In other words, a large proportion of the private railway network in and around Tokyo was built between 1926 and 1935.

In the early days (1870–1926), more private railways (510.1 km) were constructed in the Keihanshin than in Greater Tokyo. Clearly, private railways took an early lead in Keihanshin and were superior to the government railways.

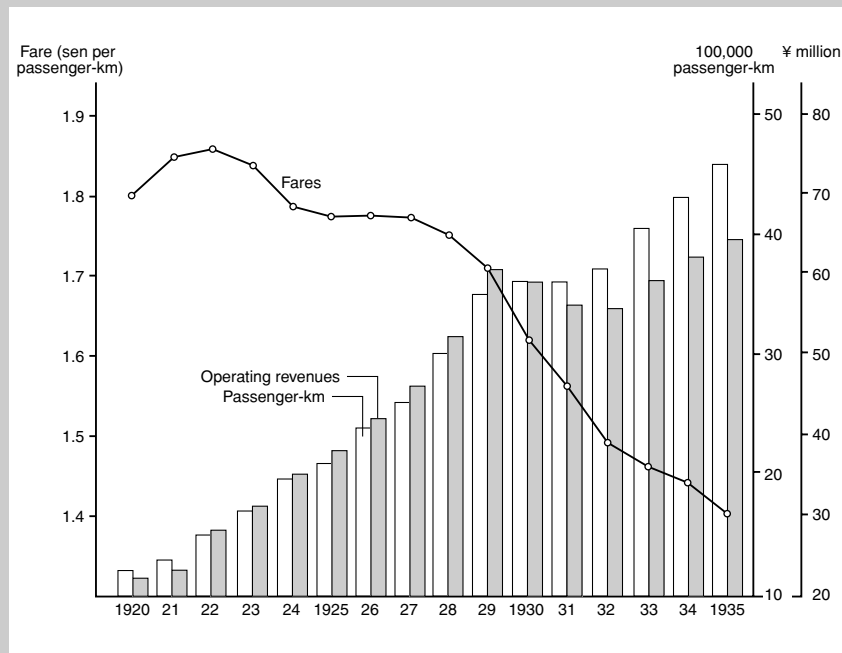
Neither can we ignore the efforts of private railways to electrify and double-track their

**Table 1 Long-term Railway Construction in Major Cities**

Year opened	Greater Tokyo			Keihanshin		
	Railways *	Private railways	Subways	Railways *	Private railways	Subways
Meiji Period (1870–1912)	487.1	139.1	0	416.0	237.3	0
Taisho Period (1912–1926)	45.3	265.1	0	0	272.8	0
Showa Period						
1926–1935	119.7	316.2	8.0	46.9	167.4	4.1
1936–1945	49.4	5.0	6.3	0	22.8	4.7
1946–1955	0	36.0	6.4	0	0	3.1
1956–1965	7.5	20.6	55.0	7.4	6.9	20.2
1966–1975	66.9	76.7	92.8	11.0	20.9	45.6
1976–1989	101.4	76.9	72.5	6.2	41.5	53.9
Heisei Period						
1989–2001	18.2	116.7	48.1	22.9	63.5	33.0
Subtotal (1936–1989)	(225.2)	(215.2)	(233.0)	(24.7)	(92.1)	(127.5)

Source: Compiled from *Annual Report on Urban Transit*  
 Note: Includes government railways, JNR and relevant JRs

**Figure 1 Fares and Operating Revenues of Prewar Urban Railways**



Source: 20-years History of Land Transport

lines between 1920 and 1930. Electrified services using railcars and electric multiple units (EMUs) over double tracks have clear advantages compared to steam-locomotive hauled services over single tracks, especially on short urban lines with many stations where short headways and quick turnarounds are necessary.

**Urban Railways and Great Depression**

As we have seen, the basic framework of the rail network in Japan's major urban centres was already established by the 1930s. But these networks were not put to a proper test immediately because of the long, worldwide Great Depression from 1929. The depression hit railway operators in Japan severely. Although construction of some new lines managed to boost ridership, the future for private railways did not look bright and there was

a battle for survival between rivals in the same market, as well as against the government railways and some new competitors—buses and taxis.

Figure 1 shows that although rail ridership increased steadily, fare revenues slumped after 1929. Private railways were obliged to compete with each other by slashing fares, but this only worsened their finances. During the decade after 1925, the fare per km of urban railways declined in real terms by about 20%. As one example, when the private Odawara Kyuko Railway (the forerunner of today's Odakyu Electric Railway) opened in 1928, its fare per km was 1.8 sen (¥1 = 100 sen).

At the time, the government railways' fare per km was only 1.56 sen. However, by 1935, Odakyu's fare per km in real terms had dropped to 1.2 sen. In other words, most private railways were forced to participate in a market characterized by fare deflation and steep competition between services; one solution was to attract more passengers through development of real estate along tracks. To summarize the situation, in 1933, representatives of the private railway industry complained to the Minister of Railways saying, 'At the present time, there are no regulations governing the setting of fares by government or private land transport carriers. Each carrier competes with the others and, as a result, the private railways are now in extremely difficult financial straits. Railway operators are forced to lower fares in order to safeguard their existence.'

In effect, the industry was asking the government to quickly change the fare structure of the government railways and to establish regulations on fare reductions in order to prevent excess competition between private railways. Such measures were especially important for a new company like Odakyu.

Regulations governing private railway fares were put into effect in 1936 with considerable improvement to the profits of private operators for some years.

**Urban Development and Transport: Postwar Years**

Japan started rebuilding after WWII and Tokyo's population began recovering from the drop experienced during the

**Table 2 Person Trips and Population in 23 Wards of Tokyo**

Fiscal year	No. of trips	Population	Average trips per person
1930	1.107 billion	4.99 million	222
1951	2.548 billion	5.82 million	439

Source: I. Watanabe, *Transportation in Tokyo*, Tokyo Metropolitan Government Transportation Bureau, Tokyo, 1954

war. Surprisingly, passenger traffic rose much faster than the population increase (Table 2).

Postwar ridership was high due to the chaotic socioeconomic circumstances. Housing had yet to be rebuilt in the bombed-out central districts, so the number of trips on Tokyo's transit system increased dramatically as many people were riding trains into the city from the less damaged suburbs and surrounding prefectures. Moreover, many people were going out to the countryside in search of food and there were also many pedlars travelling with their wares.

The extremely low capacity of all transportation modes added to the railway network congestion. Explaining why the average annual number of trips per person increased rapidly, Watanabe (Table 2) wrote, 'The lack of direct express rail connections between inner Tokyo and the suburbs made it necessary for passengers to change between trains of different operators frequently.'

But transport demand remained very high even after these special postwar factors disappeared, partly due to the long-term growth in Tokyo's population (Table 3). The postwar population growth boosted demand for services provided by the government railways and Japanese National Railways (JNR) after 1949, private suburban railways, trams, buses and subways, leading to high congestion. High postwar inflation forced operators to raise fares frequently, but the fare increases were held below inflation, meaning that fares were actually getting cheaper in real terms and leading to more demand and more overcrowding. Fare increases were held below the inflation rate for social

**Table 4 Fare Revisions in Early Postwar Years (FY1945–52)**

Fare revisions	JNR				Private railways (Tobu Railway)			
	Period	Rate <sup>1)</sup>	Fare rate <sup>2)</sup>	Period	Fare rate	Minimum fare	Notes	
1st FY1945	Mar 1946	150%	¥0.075	Same	¥0.075	¥0.20		
2nd FY1946	Mar 1947	25%	¥0.095	Same	¥0.095	¥0.50		
3rd FY1947	Jul 1947	250%	¥0.35	Same	¥0.35	¥1		
4th FY1948	Jul 1948	155%	¥0.90	Same	¥1.20	¥3		
5th FY1949	May 1949	60%	¥1.45	Same	¥1.20	¥5 <sup>3)</sup>	Minimum fare only	
6th FY1950	May 1950	-4% <sup>4)</sup>	¥1.45	Same	¥1.45	¥5	Fare rate only	
7th FY1951	Nov 1951	26%	¥1.85	Same	¥2.00	¥10		
8th FY1952	Jan 1953	10%	¥2.10	Same	¥2.30	¥10	Fare rate only	

Source: H. Moriya, *A Study of Private Railway Fares in Japan*

1) Rate of increase in real terms. For JNR only (no figures for private railways).

2) Fare rate = yen/km. Before the first revision, the fare rate was ¥0.03 and the minimum fare was ¥0.10 (10 sen).

3) At the time, fairly large differences in minimum fares were permitted between private railways. The minimum fare was ¥5 for the seven companies in Greater Tokyo and Meitetsu (Nagoya), ¥6 for Keihan, Hankyu and Hanshin (Kansai region), ¥6 for Nishitetsu (northern Kyushu), and ¥3 for Nankai (Kansai) and Kintetsu (Kansai & Nagoya).

4) This fare decrease was due to the abolition of passenger tax.

policy reasons, but the situation was very hard for operators, especially those investing in capacity increases.

### Fare Revisions in Postwar Inflationary Period

Today, a Japanese corporation cannot operate a railway without a government licence and all fares must also be pre-approved by the Minister of Land, Infrastructure and Transport. Operators cannot raise fares unilaterally, although they may make minor adjustments without prior approval. There is a long lapse between applying for a fare increase and receiving approval. Basically, the operator must prove it is operating at a loss before it can submit an application. In the past, a similar set of restrictions was applied, making profitable operations difficult during inflationary periods.

Both the fare rate and the minimum fare

rose every year from fiscal 1945 to 1952, primarily because of postwar inflation. At the time, fares for the government railways/JNR formed the basis for determining fares of private railways. As a result, the fare rate of both groups were rising, although not from the same initial level (Table 4).

In 1945, the minimum fare for both the government railways and Tobu Railway was 20 sen, but this had risen to ¥10 by 1952, despite strong public opposition. In other words, the minimum fare rose 50 times while the tapered fares rose by 30 times. The operators claimed the higher fares were needed to cover rising costs, such as the 70% rise in the cost of materials and the 300% rise in the cost of electricity. Each increase was explained as a final increase to cover inflation to that point. The ¥10 minimum fare approved in FY1952 was held for 14 years by JNR and for 7 years by the private railways. Fares were increased in an orderly manner without political intervention and the fare revision process was fair and impartial. However, the FY1952 revision did not cover the investments needed for major construction projects, such as new lines, track quadrupling, and through operations

**Table 3 Postwar Population Growth of Metropolitan Tokyo**

											(million)
1945	1950	1955	1960	1965	1970	1975	1980	1985	1990	1995	
3.5	6.3	8.0	9.7	10.9	11.4	11.7	11.6	11.8	11.9	11.8	

Source: Tokyo Metropolitan Government

on subway lines. In many cases, the budget only covered investment for short-term construction projects to provide more electric power, improve signalling and raise safety levels—areas that were all inadequate. Capacity investment focused on increasing rolling stock with no long-term plans to increase capacity.

### Private Railways during High Economic Growth Period

Japan's high economic growth period lasted for 15 years from 1956. During this time, the real average annual growth rate was about 10% with impressive gains in economic and industrial performance, and in living standards. Growth was driven by increased capital investments and technological innovation. The increased productivity permitted the most important result of all—an increase in real wages! Higher levels of income offered private railways excellent business opportunities as well as difficult challenges.

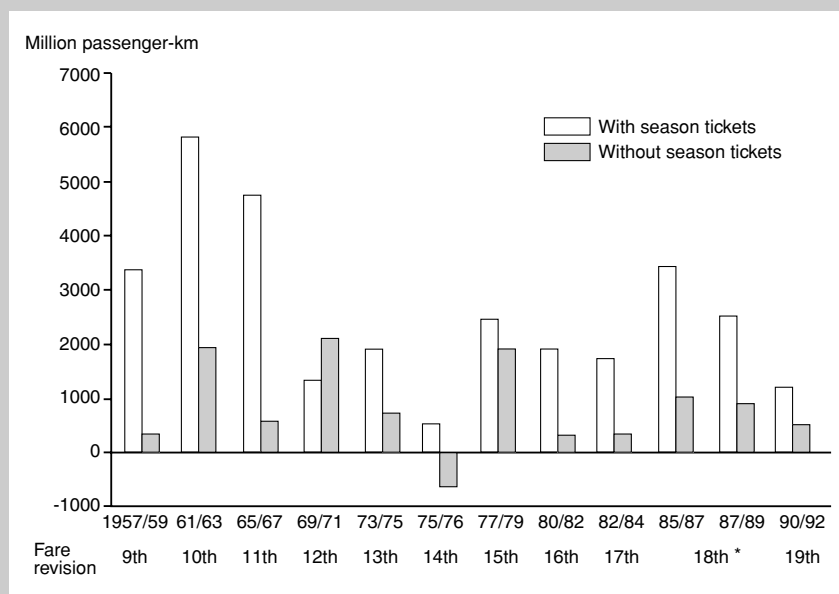
Around this time, Japanese private railways established new business in a range of non-rail sectors. In addition to continuing to promote real-estate projects and development of tourism potential near stations, they began constructing and managing station buildings, department stores, hotels, golf courses, and ski resorts. They also launched other service and construction businesses, and either managed them directly as new ventures or established affiliates to promote them. When implementing these business diversification strategies, the companies speculated that the land they were purchasing or holding would increase in value and they took great advantage of their excellent credit rating to accumulate capital. On the other hand, making profits from railway operations proved more difficult due to the massive costs both of capital and labour. Unlike the growth sectors, it was difficult for railways to raise labour productivity.

The high economic growth boosted wages in other industries, forcing the private railways to award annual wage increases to their employees. At the same time, they were investing in increased capacity. Ironically, their finances were actually improved by the extra revenue caused by the rush-hour congestion. Figure 2 shows the increase in passenger-km of private railways after each fare hike. Instead of the expected drops, passenger levels actually increased. Of course, higher ridership naturally results in higher income, so the operators benefited from both higher fares and higher ridership. This favorable situation continued until 1967. However, from the 1970s, passenger-km figures tended to show much lower rates of increase, so revenues (excluding extra income from fare increases) only increased slightly. Once again, the private railways found themselves in a difficult financial position.

### Long-term Plans to Increase Transport Capacity

To boost capacity, the private railways promoted a wide range of expensive capital projects aimed at eliminating network bottlenecks. To increase transport density, they increased both the lengths of train sets and the operation frequency. The longer train sets required extended platform and larger stations, while the increased operations frequencies required better safety measures. In addition, power equipment was upgraded and more rolling-stock sheds were built. But the most effective way to increase capacity is to build new lines, quadruple existing tracks, and introduce through operations on subway lines. Such huge improvement projects require a long-term plan that cannot be done without the cooperation of local governments and bureaucrats who must approve any urban development plan.

Figure 2 Increases in Passengers after Fare Revisions



Source: H. Moriya, *A Study of Private Railway Fares in Japan*  
 Note: Two companies raised fares in FY1985. Six raised fares in FY1987 and 1988 separately.

Actually, it is impossible to construct new lines in built-up urban areas, so track quadrupling is the most practical way to reduce line congestion. Since construction of a new line can only start after the land has been purchased and all the land in central Tokyo is fully used, new lines can only be built through less-developed areas far from the city centre. This type of new line tends to act as a feeder for existing lines and either does almost nothing to reduce congestion or may even increase it.

Although through operations from a railway on a subway line eliminate some passenger transfers and can reduce congestion to some extent, through operations have little effect on increasing capacity.

All these solutions require massive capital and long construction times, explaining why private railways have not been keen to pursue them. In the 1950s, the government held hearings on opinions about investment to increase capacity and the first 5-year plan to strengthen transport capacity was implemented in FY1957. It was soon obvious that the plan was achieving nothing and it was abandoned and replaced in 1961 with a 3-year plan. This plan was renewed and revised every 3 or 5 years until FY1996.

The plan is shrouded in mystery and no one seems to know exactly why it was drawn up. For example, it does not include a programme of specific capacity-raising investments, and nor does it clearly identify when investments should bring results. It gives no quantitative benchmarks to evaluate the actual progress and no explanations. The amounts invested by each company are listed in such a way that it is impossible for an outsider to know when, where, and how much the investments were. The plan appears to be a sham, giving only an exaggerated report of achievement rates for each fiscal year.



Keisei Line between Aoto and Takasago stations

(T. Suga)

### **Full Costing and Political Interference**

The introduction of a new fare-assessment method in 1961 was a small step towards encouraging private railways to invest in capacity. Until 1961, the government assessed a fare increase application by totalling the various company costs. The new, rate-based method was explained as a mechanism for determining fare increases by considering new costs incurred by railways making capacity-oriented capital investments.

Under the new rate-based method, the amount a company would receive through fares was calculated by multiplying the value of business assets invested in the railway by a fair rate of return. The new method determined amounts to be received through fares, regardless of actual operating costs. Under the previous method, a railway operator who had cut costs to improve its financial situation might be refused a fare increase, while an inefficient operator

who had continually pursued high-cost management practices might see its application approved. Changing the application assessment was seen as a dramatic improvement and it was anticipated that standard cost estimates would be made. It was assumed that the new method would guarantee a reasonable consideration of full costs.

But for all the rhetoric, the new method did not result in any real change. Attempts to assess full costs were often influenced by politics and the new assessment procedure lost most of its significance. This does not mean that the procedure was flawed; the problem was how it was applied. However, the method itself has not been abandoned, and even the JR group of companies—who vigorously opposed it for a while—recently announced that they would like the method applied to future fare revisions. Political considerations have often resulted in postponed or reduced fare increases and politicians have often interfered with applications for unpopular



fare increase. Table 5 shows that fare increases were often postponed, starting around the time of the 1957 increase. A reasonable fare increase that would normally have taken 2 or 3 months to

approve and implement was often postponed or temporarily denied. As an example, in 1961, the then Minister of Transport refused to change the government's capping policy even while

admitting that a fare increase was needed to achieve the objectives of the plans to strengthen transport capacity.

### Reasons for Low-fare Policies and Results

There were two main explanations for opposing fare increases. The first was that since private railways were profiting from their diversified non-rail businesses, they should use some of those profits to cross-subsidize fares. However, it was obvious that railway operations had to be treated as a self-supporting business in order to promote capacity investments and reduce congestion. The second was that wage increases are natural in industries where labour productivity is rising, but it was not in the national interest for wages to rise at companies and industries—such as private railways—where labour productivity was stagnant. The railways argued that they needed to raise fares to compensate for rising wages, but increasing employees' wages was seen as causing a ripple effect that would stoke inflation. At that time, the Federation of Private Railway Workers' Unions campaigned every spring for higher wages and called frequent strikes. The labour supply and demand conditions prevailing clearly show that the railways had to offer higher wages in order to keep their workforce.

The government's policy of holding down private railway fares was plainly evident by the early 1960s. The Cabinet Council, which was established to draw up anti-inflation measures, indicated it was prepared to cap public utility rates—including private railway fares—as a brake on rising prices.

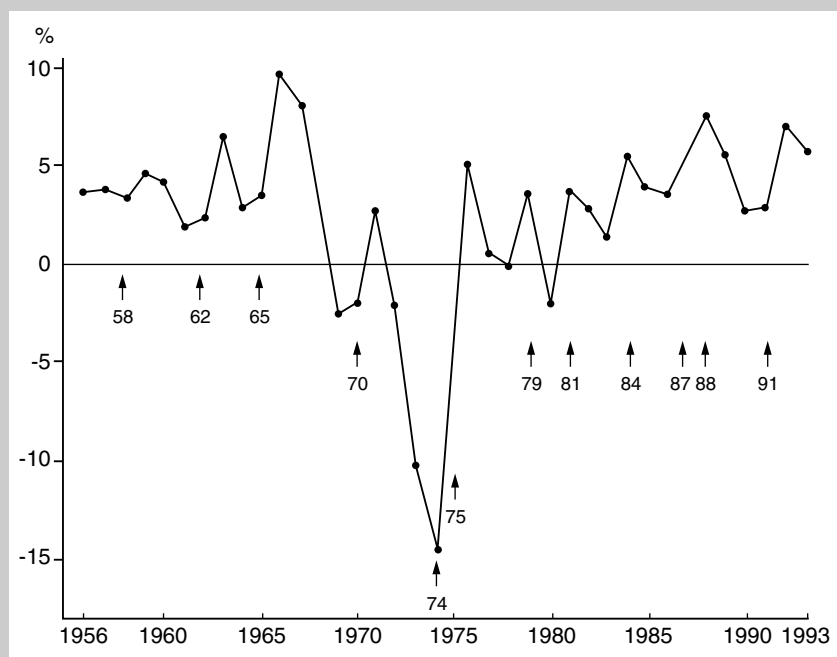
This policy was maintained for some time and greatly reduced the profitability of private railways over the long term. Private rail operations piled up huge deficits, leading to the abnormal situation of non-rail business supporting overall business (Fig. 3). Unfortunately, the real

**Table 5** Periods to Revise Fares (Application to Implementation)

	Application date (A)	Discussion date (B)	Verdict date (C)	Approved date	Implementation date (D)	Screening period A to B	Deliberation period B to C	Total period A to D
8th	25 Nov 1952			27 Dec 1952	15 Jan 1953	–	–	2 months
9th	2 Jul 1957	6 Jul 1957	16 Dec 1958	26 Dec 1958	4 Jan 1959	0 month	18 months	18 months
10th	5 Aug 1961	15 Aug 1962	19 Oct 1962	19 Oct 1962	1 Nov 1962	0 month	14 months	14 months
11th	11 Jan 1965	18 Aug 1965	10 Jan 1966	11 Jan 1966	20 Jan 1966	7 months	5 months	12 months
12th	12 Dec 1968	13 Jan 1970	25 Sep 1970	25 Sep 1970	5 Oct 1970	13 months	8 months	21 months
13th	1 Jul 1972	2 Oct 1973	11 Jul 1974	12 Jul 1974	20 Jul 1974	15 months	9 months	24 months
14th	29 Aug 1975	25 Sep 1975	2 Dec 1975	5 Dec 1975	13 Dec 1975	1 month	2 months	3 months
15th	12 Aug 1978	7 Sep 1978	7 Dec 1978	15 Dec 1978	8 Jan 1979	1 month	3 months	5 months

Source: H. Moriya, *A Study of Private Railway Fares in Japan*  
 Note: Data from applications made by Tobu Railway.

**Figure 3** Operating Profit/Loss Ratios for Rail-based Operations after Interest Payments (14 Major Private Railways)



Source: H. Moriya, *A Study of Private Railway Fares in Japan*  
 Note: Arrows (↑) indicate fare revisions.

estate and other non-rail businesses could not sustain the needed profit levels for long and subsequent losses greatly hindered the drive to boost capacity. As a result, the companies postponed key investments, slowing congestion-reduction efforts.

Table 6 shows that the ratio for key investments envisaged by the plan to strengthen transport capacity declined considerably between FY1972 and FY1986. Indeed, it emphasizes the tendency of private railways to ignore the need for key investment.

### JNR's Five-Direction Strategy

The investment policies of JNR were very different from those of private railways. Although JNR had shown little previous interest in urban transit, it began tackling congestion on its commuter trains in earnest in 1965, when the public and politicians made it clear that they regarded congestion as the most serious transportation problem.

The private railways were not keen to make key investments with little chance of profitable returns but JNR began a programme of extremely active investment in urban railways from 1965 because it did not need to make profits for shareholder and investors. Congestion on commuter trains had become so bad that even the foreign press was making fun of the so-called 'people-packers' on station platforms. As a result, JNR decided to invest heavily in new construction, regardless of the short-term negative impact on its balance sheet.

This goal of increasing commuter capacity in the urban centre became a major part of JNR's efforts within the framework of the third long-term railway improvement plan (fiscal 1965–71). In Tokyo, JNR began quadrupling and even sextupling tracks used by commuter trains. These lines radiate from central Tokyo in five



JR East's Sobu Line between Ichikawa and Moto Yawata stations

(T. Suga)

**Table 6 Result of Investment Plans to Increase Transport Capacity (14 Major Private Railways)**

	(¥100 million)				
	1967-71	1972-76	1977-81	1982-86	1987-91
<b>Key investments to increase transport capacity</b>					
Construction of new lines into city centre	646	411	154	172	781
Track doubling and quadrupling	409	514	407	408	1,503
Subtotal (A)	(1,055)	(925)	(561)	(580)	(2,284)
<b>Additional investments to increase transport capacity</b>					
Lengthening platforms and other station improvements	619	1,049	1,170	1,420	2,343
Construction and procurement of new rolling stock, etc.	550	465	681	673	1,411
Construction of new electrical facilities, etc.	176	250	323	408	629
Construction of new rolling stock buildings, etc.	176	138	209	488	497
Other	295	272	362	342	738
Subtotal (B)	(1,816)	(2,174)	(2,745)	(3,331)	(5,648)
<b>Additional investments to strengthen operations</b>					
Construction of elevated track, level crossing upgrades, etc.	414	657	740	1,082	1,236
Increased operation safety, replaced rolling stock, etc.	227	514	841	1,288	2,092
Construction to raise track safety	351	684	826	1,036	1,168
Other safety-related construction	470	506	771	1,094	1,645
Construction to improve services	-	234	541	674	1,250
Subtotal (C)	(1,462)	(2,595)	(3,719)	(5,174)	(7,391)
<b>Additional investments total (B + C)</b>	(3,278)	(4,769)	(6,464)	(8,505)	(13,039)
<b>Total (A + B + C)</b>	(4,333)	(5,694)	(7,025)	(9,085)	(15,323)
<b>Key investment ratios: A/(A + B + C)</b>	0.24	0.16	0.09	0.06	0.15

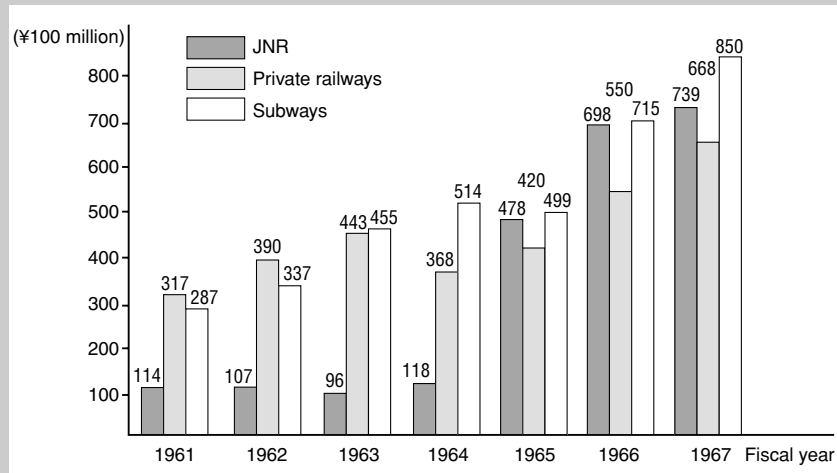
Source: H. Moriya, *A Study of Private Railway Fares in Japan*

directions, so JNR called its new policy the Five-Direction Strategy (Fig. 4). These investments helped reduce the awful overcrowding on service in the

Tokyo Metropolis and were instrumental in the later successes of JR East soon after the JNR privatization.



**Figure 4 Results of Investments to Increase Transport Capacity of High-speed Railways in Greater Tokyo and Keihanshin Region**



Source: *White Paper on Transportation, Fiscal 1968*  
 Notes: (1) Data from Railway Supervision Bureau, Ministry of Transport  
 (2) JNR includes Japan Railway Construction Public Corporation  
 (3) Private railways means only major private railways

### Special Measures Law for Promotion of Railway Construction

The government policy of keeping private railway fares low was a mistake. Unfortunately, the new rate-based method used to assess fare increase applications, could not sufficiently promote capacity-raising capital investments by itself. This realization led to development of a new policy embodied in the 1986 Special Measures Law for the Promotion of Railway Construction in Designated Cities, giving preferential treatment to railways investing in construction projects to increase capacity. The law permits private railways meeting certain conditions to establish non-taxable capital reserve funds to be used for capital investments to increase transport capacity. The fund capital accumulates from a fare surcharge (3% to 6%) levied with government approval up to a maximum reserve limit of 25% of the estimated construction cost. The fund can be held for a maximum of 10 years and the fare

surcharge is to be returned to passengers as a fare decrease for 10 years after the construction is completed. The intention of the system is to allow the company to borrow the capital from passengers before the construction so that passengers do not have to pay for the investment through higher fares after completion. This new investment sourcing method was criticized by some, but generally received a warm welcome.

However, the incentives envisioned by the law are not very effective despite a later amendment raising the maximum fund limit, because a company would need a much longer time—close to 30 years—to recover the money invested in projects, such as quadrupled lines. This explains why many private railways have not participated in the system. Furthermore, the greatly changed economic situation since the law was introduced has prompted some companies to change their investment plans or to abandon them altogether.

Only five private railways in Metropolitan Tokyo are participating in the system. The

other 10 major private carriers are not promoting any construction that would qualify under the system.

Although it is difficult to judge the policy, it appears to have been ineffective in promoting new investment but it facilitated existing investment plans to increase transport capacity and has merit on that account.

### Stable, Profitable Times for Urban Railways

Strangely, the private urban rail industry has enjoyed a stable financial environment since the late 1990s. Although a new trend of declining ridership has reduced congestion on trains used by commuters and students, it has not pushed carriers into the red. In the past, although operating income rose as congestion worsened, the growing number of passengers pushed costs up too, forcing companies to increase fares every 2 or 3 years to avoid going into the red. However, fares have remained steady for the last 6 years despite declining ridership year-on-year. This is a new phenomenon not experienced by railway operators in the postwar years.

Conversely, the condition of the non-railway business of the 15 major private railways has worsened since the late 1990s and they are scrambling to recover. Previously, when railway operations were in financial difficulties, income from non-railway businesses supported the companies as a whole. Today, the reverse is true. Falling real-estate prices have adversely impacted the values of many investment properties and some companies are taking emergency measures, including disposition of capital reserves to deal with latent losses.

In railway operations, three major factors have combined to ensure a more satisfactory and stable net income. First, interest rates are low and this has reduced borrowing costs. Second, new labour-

saving technologies such as ticket vending machines, automatic ticket wickets, automatic fare-underpayment calculation machines, and unmanned safety-related devices have cut labour costs. Third, the deflationary economy has lowered wage pressure throughout industry as a whole, which has alleviated wage pressures on railways too.

Under the Special Measures Law, reserve-fund financed construction is scheduled to be terminated in fiscal 2004 and then fares are supposed to be reduced by the previously levied surcharge. However, the companies' loans will increase the capital cost after construction and, additionally, the cost of depreciation will be so great that we cannot be sure the companies will reduce fares by the full amount.

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### Future Passenger Demand and Fare Structures

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It will be interesting to see what role urban railways play in Japan in the future and how their fare structures will change. This section examines these questions from a number of different viewpoints, looking first at the transit market and ridership, and then at fares and costs.

First, we should note that the private railways and the JR group of companies have two things in common—their ridership is declining over the long term, and their role in the urban transit market is shrinking. Some people favour trains over all other transport modes because they are environmentally friendly. But will this advantage hold up after the introduction of smaller, lighter vehicles powered by fuel cells? Nobody can say definitively that trains are by far the best form of transport for the average person and even most railway employees probably own a car!

Japanese railway operators must ask themselves some searching questions: Are fares at proper levels? Why is

ridership declining over the long term? What needs to be changed to attract more passengers?

Unfortunately, although operators are eager to increase fare revenues, they rarely think of doing so by increasing ridership and journey length. Their first thought is always to raise fares, which may be a good way to boost profits, but may also reduce the number of passengers.

This lack of foresight was seen when new track was built between Ueno and Tokyo stations to allow shinkansen from the north to terminate at Tokyo Station instead of Ueno. Did the planners consider another option—to spend the money on a conventional, narrow-gauge line instead? Probably not. Choosing the second option would have boosted capacity on the more heavily used conventional track to reduce congestion and increase ridership. We need only compare the transport density on the two sections—the Ueno–Tokyo shinkansen track section and the Ueno–Tokyo conventional line—to see they made the wrong choice. If the premise is that urban rail services are important, conventional track should have been constructed to permit trains on the Tohoku and Takasaki lines (which terminate in Ueno) to offer through services to Tokyo Station and beyond onto the Tokaido main line. Unfortunately, the decision makers did not respect this premise.

What about fares? If an urban railway makes key investments to improve services and comfort, its operations will be saddled with considerable cost burdens. The result will be a short-term

increase in transport costs, and fares will probably be raised. But the higher fares are offset by improved comfort and convenience, so they cannot be considered as a simple fare increase. Most passengers will quickly understand that quadruple track offers more advantages than double track, and will tend to use and appreciate it over the long term.

When assessing an application for a fare increase, overall capital investments are now calculated under the rate-based method. However, three of the JR companies have never increased their fares since 1987. At one time, they believed that the price-cap method offered advantages and were keen to have it adopted. However, they abandoned this position later when it became obvious that price caps would not be to their benefit given the subsequent price deflation. JR East's president once claimed that railway fares should be determined not on the basis of cost, but according to what the competitive market could bear. It would be interesting to know his position today! Given today's stagnant economic conditions it is doubtful whether railway fares are competitive with motor transport. Trains have the competitive advantage only when transporting commuters and students. It can be argued that railways are more likely to survive if they increase ridership by reducing fares in markets where they are not competitive, and by raising fares in markets where they have a competitive edge.

Clearly, the future of urban railways will not be secure unless new fare structures are developed. ■



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