# Who should take responsibility for unexpected interest changes?

## Lesson from the privatization of Japanese railroad system

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**Abstract**

Due to inefficient operations exacerbated by political intervention, Japanese National Railways (JNR) was finally dissolved in 1987 after piling up huge debts. Fortunately, a passenger rail service had and has the potential to become viable business because the population density per habitable land is exceptionally high in Japan. Indeed, there have been many profitable non-JNR rail companies mainly in the Tokyo and Osaka metropolitan areas for years.

Although Japan's high population density gives a passenger rail service an advantage over those in other industrialized countries, the density is not even. Therefore, JNR as a passenger rail operator was not only dissolved but also divided into six regional companies, of which three have inherited debts as well as assets from JNR but the other three have inherited only assets and been additionally given extra financial assets.

Under these arrangements, the three profitable companies in highly populated areas were expected to earn operating revenues sufficient to service the debts, while the other three unprofitable companies in sparsely populated areas were expected to lose money in rail operations but sufficiently small to be covered by interest income on their financial assets. The mechanism was then considered incentive-compatible because (1) the profitable three would have to pay the debts but amass more profits than expected should they enhance their efficiency, and (2) the unprofitable three could earn profits should they lose less money in rail operations than expected by efficiency gains.

Actually, all have done better than expected in a profit (loss) before interest. The profitable three have earned more than expected and got listed on Tokyo and other stock exchanges, while the unprofitable three have lost less than expected. The initial policy goal that the inefficient national rail service be vitalized under the incentive-compatible scheme seems to have been accomplished.

However, this apparent success story is not that simple. Japan's extremely low interest rates, which no one expected to happen when designing the original scheme, have affected the profitable three and unprofitable three in diametrically opposite directions. For the former, a reduced amount of interest *payment* have increased their profits after interest and taxes, while, for the latter, a reduced amount of interest *income* has given rise to decreased profits and in some years resulted in net losses after interest.

To curb this unexpected income transfer, the Japanese Government has devised a clever but not transparent program. Although it is difficult to decipher from publicly available information, now the profitable three are de facto forced to borrow at artificially high interest rates from the unprofitable three. In short, the former subsidize the latter through the backdoor. Should shareholders allow their companies to help other unrelated companies though there does not seem to be any synergy? But, then, who should take responsibility for unexpected interest changes? What should we have done when devising the initial scheme? We give some thoughts to these important but difficult questions.

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### 1. Introduction: Road to the Dissolution of Japanese National Railways (JNR)

Junichiro Koizumi, our prime minister since 2001, is widely considered the most reform-oriented Japanese politician in recent years. However, though his seemingly uncompromising stand against vested interests is very popular, it is not the case that his specific agenda such as the privatization of postal service are either well understood or enthusiastically supported. Some cynics assert his reform is as superficial as himself.

It is true that there are varied opinions on his policies as well as his personal style, but we may be allowed to claim that what he has accomplished in governmental reform pales in comparison with what was initiated in the mid-1980s under Prime Minister Yasuhiro Nakasone: the dissolution and breakup of the national rail service. Some argue that it is not hyperbole to claim this reform as a peacetime revolution.

Since the first passenger train ran between Tokyo and Yokohama in 1872, the Japanese Government and private companies had expanded their rail networks. In 1906, most private railroads were nationalized, though some urban passenger commuter lines remained private and thrived thereafter. After World War II, by order of General Douglass McArthur, the national railroad was separated from the central government and a public corporation named Japanese National Railways (JNR) was established in 1949. In the 1950s, under ever increasing traffic volume, JNR with a rail network of more than 20,000 kilometers was generally profitable and launched an ambitious construction plan of the *Shinkansen* (Bullet Train) route between Tokyo and Osaka to resolve a serious bottleneck then existed. The Tokaido *Shinkansen* line, which was then believed to symbolize a promising future of not only Japanese railroad but also Japan herself, began to offer service at a then world record speed of 210 kilometers per hour in 1964. But, the year 1964 was actually a decisive turning point heading for a catastrophe in hindsight. JNR never made a profit from 1964 to 1987 when its debt reached 25.1 trillion yen and was finally dissolved in disgrace.

Fortunately, however, a passenger rail service had and has the potential to become viable business because the population density per habitable land is exceptionally high in Japan (Figure 1), though there are few, if any, niches for a freight rail service. Large cities with more than million inhabitants exist every few hundred kilometers along main routes, while commuters in Tokyo and Osaka, two of the largest metropolitan areas in the world, have no choice but to use trains every day and night. Therefore, the share of a rail service in passenger traffic is exceptionally high in Japan compared to other industrialized countries (Figure 2).

The above mentioned environments suggest the failure of JNR should be due to more mismanagement under poor governance mechanism rather than structural decline brought about by motorization. This judgment is not a wishful thinking. Those non-JNR metropolitan rail companies that survived the 1906 nationalization have been profitable for years, a century indeed.

Why couldn't JNR make it under relatively favorable circumstances? First, politicians forced JNR to construct many unprofitable new lines without any compensating subsidy to woo electoral support particularly in rural areas where a rail service has been most hit by motorization. Second, major unions, which were extremely hostile against management partly due to their Marxist ideology, devastated the morale and discipline of employees making customers abandon JNR. Third, even top managers, who were not given full responsibilities of control and forced to acquiesce to governmental interference routinely, lacked a profit motive. These three problems stem from a vague status of JNR. It is neither a governmental body guaranteed to receive taxpayers' money to operate and serve public interest nor a for-profit corporation given freedom to do business and expected to make ends meet by itself.

Fourth, because monopoly in transportation was lost by rapid motorization, the national rail network no longer cohered as a meaningful unit and its centralized control became obsolete and inefficient. Fifth, it had become impossible for a limited base of profitable lines to cross-subsidize a vast amount of money-losing lines. These two problems stem from the fact that the national network is too diverse to be managed effectively by one corporation.

After JNR attempted several piecemeal reforms but miserably failed, mounting public criticism about poor service, frequent illegal strikes and skyrocketing fares with piled-up debt impossible to redeem made a limited number of JNR middle managers determined to restructure the whole system. With the support of the mass media as well as some leading politicians, the Young Turks finally succeeded to convince Prime Minister Nakasone, who fired the incumbent top management resisting the restructuring and appointed a new president in 1985. His judgment was amply rewarded with a landslide victory of the ruling Liberal Democratic Party in that year's general election in which the JNR reform was a (maybe the) major issue.

After this introduction, we summarize the JNR reform in Section 2 and the operating performance of regionally divided rail companies under the new regime in Section 3. Then, we describe an unsettled issue of the reform, inter- and intra-company profitability adjustment in Section 4 and consider its policy implication in Section 5. Section 6 is a brief conclusion.

## 2. What Was Implemented? JNR Reform[1]

The JNR reform in April 1987 mainly consisted of the following five specific measures:

(1) JNR was broken up into seven Japan Railway (JR) companies[2] which consist of six regional passenger rail companies based on traffic patterns[3] and one freight rail company[4]. Each company has been given limited (for-profit) company status, but was initially wholly owned by Japanese National Railways Settlement Corporation (JNRSC), a wholly government-owned entity. In order to ensure the managerial autonomy of the rail companies, the Japanese Government was expected to privatize each rail company as soon as possible. Also the government eased managerial supervision and regulation on the new rail companies compared to those on JNR or other government-related not-for-profit entities. JNR operated a rail service in four major islands of Japan, Honshu, Hokkaido, Shikoku and Kyushu. Three regional companies, Hokkaido Railway Company (JR Hokkaido), Shikoku Railway Company (JR Shikoku) and Kyushu Railway Company (JR Kyushu) have been set up for the latter three islands. Because Honshu, the main island of Japan, is by far the largest and includes the three largest

[1] East Japan Railway Company (1995) is the most authoritative summary available in English for the JNR reform.
[2] An independent research institute and other special organizations were also incorporated.
[3] More than 90 percent traffic was completed within each company.
[4] Why a freight service has been separated from the six regional companies is not entirely clear then and now. Unlike a passenger service, the share of railroad in freight traffic volume was insignificant in the mid-1980s, and no viable future was and is in sight. Since its inception, the freight rail company has been paying usage fees based on avoidable (short-term marginal) cost to the passenger companies which own rail lines except some freight only ones in their respective regions. Although this structure has brought about many distortions and inefficiencies both for passenger and freight companies, we will not delve into problems concerning a freight rail service and its operator, JR Freight, in this paper.

metropolitan areas, Tokyo, Nagoya and Osaka, a rail service in this mainland has been further divided into three regional companies of which headquarters are located in these three mega-cities. They are called East Japan Railway Company (JR East), Central Japan Railway Company (JR Central), and West Japan Railway Company (JR West) respectively.

(2) The newly established JR companies inherited minimally necessary assets from JNR to operate their rail and related business and assumed a reasonable amount of JNR's debts which would not impede the financial stability of the new rail companies. The remaining non-operating assets and liabilities were transferred to JNRSC, which was expected to repay as much as possible selling inherited assets, real property in particular, and the shares of the new rail companies. The remaining amount which JNRSC could not repay in the end was to be transferred to the general account of the Japanese Government.

(3) The new JR companies continued to hire a vast majority of ex-JNR employees[5], the number of which was about 20 percent more than required for operating the existing rail lines efficiently. The remaining ex-employees belonged to JNRSC temporarily, and were to be given support to find new jobs for three years.

(4) The *Shinkansen* lines operated by JNR were not uniform in their profitability and recorded at substantially different book values due to the difference of construction periods. Therefore, the *Shinkansen* assets in their entirety were to be held by the wholly government-owned *Shinkansen* Holding Corporation (SHC), and the three mainland rail companies, JR East, JR Central and JR West leased the *Shinkansen* facilities[6] paying usage fees determined by SHC according to traffic volume.

(5) Extra financial funds called Management Stabilization Funds were set up for the three passenger rail companies operating in three islands, JR Hokkaido, JR Shikoku and JR Kyushu. They were expected to cover their loss in rail operations with interest income from the funds.

Although each of the five measures are instrumental in realizing the JNR reform, the

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[5] Legally, they were hired on the first day of JR companies upon being fired on the last day of JNR.

[6] JR East operates the Tohoku (between Tokyo and Morioka) and Joetsu (between Tokyo and Niigata) lines, JR Central the Tokaido line (between Tokyo and Osaka) and JR West the Sanyo line (between Osaka and Fukuoka).

fifth and last one is directly relevant to our main concern, inter-regional profitability adjustment[7].

When JNR was divided into six regional passenger rail companies, three companies in the mainland, which were given areas of high traffic volume, were expected to make profits from rail operations if they would be able to maintain the traffic volume when JNR was dissolved[8]. To be more specific, JR East was given the Tokyo metropolitan area, JR West the Osaka metropolitan area and JR Central the Tokaido *Shinkansen* line between Tokyo and Osaka.

On the other hand, the other three passenger rail companies in three smaller islands, JR Hokkaido, JR Shikoku and JR Kyushu, must operate in areas of low traffic volume and were believed to have no chance to break even, let alone make profits, in rail operations, because other transportation means such as automobiles have more competitive advantages over trains in these less populated areas.

In order to tackle this profitability differential, three possible schemes were said to be considered: (1) giving governmental subsidy to compensate for a loss from rail operations every year; (2) cross-subsidizing the island companies with the profits of the three mainland companies; (3) setting up a one-time extra financial fund for the island companies to cover an annual operating loss with interest income. The third mechanism has been adopted in the end, and accordingly a 1.3 trillion yen fund was established and added on to the debts of JNRSC. No one then anticipated that this seemingly well-structured scheme would pose a totally unexpected problem to the JR companies and the government later.

## 3. Did the Reform Go Well? Operating Performance since JNR Dissolution[9]

Half a year before the new regime started in April 1987, the government announced prospective traffic volume and profits for the first fiscal year 1987[10] in October 1986. In this announcement, all the six regional companies were expected to earn a modest nonetheless

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[7] See Appendix for some details on the first four measures.

[8] The fact that these three ex-JNR and other non-JNR urban rail companies make profits incurring construction cost may astound some readers because even urban rail operations are generally money-losing outside Japan (Winston 2000).

[9] Data on JNR, JR companies, related governmental bodies, etc. are from respective published annual reports and other publicly available sources, mostly in Japanese.

[10] Traffic volume and financial results are in terms of fiscal year, which starts in April and ends in the next year's March.

positive profit. In February 1987 the government made public an aggressive five-year outlook with an upwardly revised prospect for 1987. These estimates were naturally criticized as too optimistic even by those who supported the reform because too rosy a picture would unduly disappoint the public and spoil the reform should it turn to be wrong. However, the passenger companies surprised the public by outperforming these estimates.

Although the structural reform undeniably contributed to good performance, the gods surely smiled on passenger companies. Extrapolating the rise of fares almost every year since the 1970s, the government expected a continual increase of fares with stable or at worst modestly declining traffic volume resulting in rising revenues under the new regime. However, in addition to dramatically improved customer service once notorious for its poor quality (or the lack thereof) and increased train frequency, the booming Japanese economy made traffic volume and consequently revenues increase without a fare rise. That is, the so-called bubble economy in the late 1980s and early 1990s coincided with the JNR reform. The total JR (ex-JNR) traffic volume increased by 3.2 percent in 1987, 6.3 percent in 1988, 2.3 percent in 1989, 6.7 percent in 1990 and 3.9 percent in 1991 (Figure 3). The new passenger rail companies exceeded a three percent annual increase of revenues to be expected through continual fare rises as before, only with an increase of traffic volume. This initial stunning success with markedly improved customer service has cemented public support for the JNR reform more firmly than expected.

However, the so-called bubble economy ended in 1991 and Japan entered a long period of recession. Japan's demographic prospect is not encouraging either. The anticipated graying of the population has been accelerated by one of the lowest birth rates in the world. The working age population (between 15 and 65 years old), which comprises a vast majority of passengers, passed its peak in 1995, and even the entire population began to decrease in 2005. Moreover, people continue to move into metropolitan areas such as Tokyo, which makes the regional difference of population density larger than ever. Airport and highway networks have been remarkably expanded since the passenger companies started to operate in 1987. Put briefly, more and more rail lines, inter-city ones in particular, are losing their competitive advantages over rival transportation means.

Despite this unfavorable change of circumstances, JR East, JR Central and JR West, the three regional companies in the mainland, continue to make profits without any fare rise[11]

[11] Fares were adjusted twice due to the introduction of three percent consumption (value

except JR West in 1998[12] thanks to stable traffic volume (Figure 4). With their steady performance, these mainland companies have got listed on Tokyo Stock Exchange and other exchanges and are now considered blue chips by foreign as well as domestic investors.

On the other hand, the three small island companies seem to struggle to make ends meet though they have successfully resisted the once definitely downward trend of traffic volume (Figure 5) since the new regime started in 1987. JR Hokkaido recorded a loss in four consecutive years from 1995 to 1998, JR Shikoku in 1994, 1995 and 1998, and JR Kyushu in 1995 and 1998, though they raised fares by 6.6 percentage points on average together in 1996. The effects of the fare rise did not last beyond an immediate few years and their revenues bounced back to the pre-rise level thereafter, but these island companies keep themselves in the black slashing operating expenses.

Three out of the five major problems JNR suffered, excessive unprofitable investment, lack of work discipline, and lack of managerial independence, have been effectively resolved once top management was made independent of outside influence and responsible for the performance of their companies, and in tandem the government was kept from subsidizing them right from the start. This is a regime change par excellence from the soft budget constraint to the hard budget constraint by a governmental commitment (Kornai 1986; Kornai et. al. 2003).

Although the JNR reform has been called and considered the privatization of JNR by the government and the mass media as well as the general public, privatization in the sense that share ownership is transferred from the government to private investors does not seem to be a sine qua non for hardening the soft budget constraint. Actually, it is not an unfounded exaggeration to claim that the three island companies, still wholly (indirectly though) owned by the government, are more cost-conscious and customer-oriented than the privatized mainland companies. Because competition with other transportation means is fiercer in the sparsely populated islands than in the mainland full of metropolitan areas, the island companies cannot but make more efforts than their mainland sisters. This phenomenon is consistent with the fact that not-for-profit organizations are as efficient as their for-profit rivals in competitive industries (Glaeser 2003), though the privatization and its future possibility are likely to function as an ingenious pretext for resisting potentially rampant

added) tax and its subsequent tax rate rise to five percent.

[12] This loss was due to extraordinary charges related to a change of pension accounting.

outside intervention. Moreover, the mainland companies would be far less efficient than they actually are if they had not been privatized, because they still maintain a quasi-monopoly status in some densely populated urban and inter-city markets different from the island sisters lacking any lucrative market.

The fourth problem, inefficient centralized control, does not seem to require the establishment of several regional legal entities as the only solution. Though the centralized management of JNR was indeed a serious impediment to more efficient operations, the delegation of more authority to local operation managers would have been sufficient to temper the problem. However, it is undeniable that a separate (for-profit) legal entity signifies more independence from outside influence, even if owned by a parent entity, in Japan than in Anglo-American common law countries. Therefore, the break-up of JNR into the six regional companies was most likely to be an effective shock therapy to awaken dormant independent spirits among ex-JNR men and women and deter outside intervention substantially.

## 4. What Remains to Be Resolved? Two Decades After

Now we want to evaluate whether and how far the fifth problem, unsustainable cross-subsidization, has been mitigated through profitability adjustment among regional companies based on the setting-up of compensating financial funds. Our criterion is how incentive-compatible and equitable the initially designed scheme was.

If we took a passenger rail network as a kind of universal service, we might set a uniform rate nationwide under the constraint that revenues equal expenses in total. It is true that the higher population density of Japan offers favorable circumstances to a rail service compared to other industrial countries, but only a limited number of intra-city and inter-city lines could earn revenues sufficient to meet operation and maintenance cost with passenger fares. Therefore passengers in those lucrative areas would be necessarily charged higher fares than covering their cost in order to break even in total, because fare revenues in other areas should be far less than cost incurred there. However, this strategy is what the ailing JNR tried, and did not work as planned because under this scheme of cross-subsidy a national rail network would lose customers to non-JNR commuter rail companies in highly populated areas, and airlines and highway bus operators in heavy traffic inter-city markets that only charge fares sufficient to cover their respective cost.

In the first place, the assertion that a rail network is part of universal service is no longer persuasive. In sparsely populated areas, automobiles have far more advantages as a means of transportation. In actual fact, virtually every household in those areas has at least one private car in industrial countries such as Japan. Even for youngsters, senior citizens and others who cannot drive a car, a bus is more flexible and convenient than a train to use. Moreover, a bus network costs less than a rail one for society to maintain as a minimally required safety net for the disadvantaged.

Some argue that political cost is high for abolishing local rail lines because Japanese take railroad as a symbol of civilization and even those who do not use a train at all attach high psychological value. This story, however, does not fit what happened before and after the JNR reform. In the last days of JNR, rail lines with less than 8,000 daily passengers per kilometer were designated as Local Lines requiring ten percent higher fares than Main Lines with more than 8,000 passengers. Among the Local Lines, those with less than 4,000 daily passengers per kilometer were labeled as Special Local Lines to be replaced by a bus service. Consequently rail lines of roughly 3,000-kilometer length were abolished in the 1980s, which refutes the rail-as-universal-service argument.

We might go in the opposite direction. What would happen if each line were treated as an independent business unit and no cross-subsidy were allowed? On the one hand, fares for the Tokaido *Shinkansen* line and intra-city lines in the Tokyo and Osaka metropolitan areas could be substantially reduced, but supply under current capacities might not meet increased demand at least in the short run. On the other hand, a huge increase of fares for light traffic lines in rural areas would be necessary, but it should further reduce already limited demand making it impossible to break even[13].

Neither of these two extreme positions, the uniform rate and the line by line different rates schemes, seems to be a viable option. That is why the regional division of the national network is a core ingredient of the JNR reform. Given sufficient profit motives and independence, each regional company should become not only an efficient unit that can offer a distinct service suitable for a respective customer base but also a basic unit of cross-subsidy that may make it possible to maintain some, though not all, remaining local lines after the abolition of the Special Local Lines.

However, in order to make the JNR reform politically acceptable, the government

[13] Even if we took network externalities into consideration, our argument would basically remain intact.

had to constrain any sudden divergence of a fare structure among the six regional companies just after the new regime started, though fares must inevitably diverge as time passes. Therefore, the government would have to set up a mechanism to curb profitability differentials, particularly those between the three mainland companies and the three island ones. As mentioned in Section 2, several schemes were considered. Managers of each company would not make every effort to realize its full potential should they know profit adjustment be implemented ex post. Therefore, the government thought it wise to tie its hands ex ante in order to make a scheme incentive-compatible[14] letting the regional companies keep all what they would achieve and not be given any additional help under the new regime.

Mainland operations were profitable as a whole though it was difficult to partition the mainland network into profitable and naturally separated regional units. At the time of the JNR reform, geographically integrated division has been realized with an adjustment of profitability through usage fees of the *Shinkansen* facilities. However, the mainland companies decided to purchase the *Shinkansen* facilities from the government-owned SHC four years after the new regime started instead of continuing to pay usage fees indefinitely[15].

By contrast, the rail operations of three naturally integrated units, that is, three islands, would not be able to break-even, let alone make a profit. That said, it was not politically acceptable to keep only a limited number of urban lines abolishing a vast majority of the island operations. On the other hand, unspecified continual subsidy or a lack thereof would most likely replicate JNR's failure. For this reason, one-time financial funds called Management Stabilization Funds have been set up to compensate for a loss from rail operations with interest income.

As a general rule, abiding by an initially set mechanism is preferable to adjusting discretionarily ex post in order to avoid the moral hazard of managers. However, the government has to choose some parameters, either fixed or adjustable according to preset rules. In the scheme above, the government need forecast the future profitability of each passenger company and the prospect of interest rates, on the latter of which interest payment and income crucially depend. The chosen scheme seemed to have an advantage over another

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[14] The mechanism was then considered incentive-compatible because (i) the profitable three companies would have to pay the debts but amass more profits than expected should they enhance their efficiency, and (ii) the unprofitable three companies could earn profits should they lose less money in rail operations than expected and earn interest income on their financial assets.

[15] See Appendix for details.

likely candidate, a governmental pre-commitment to annual fixed subsidy, because it would avoid the possible future policy reversal. No one denies that too much trust on governmental promises is not sound corporate behavior. That is why the mainland companies decided to purchase the *Shinkansen* facilities from the government-owned SHC as mentioned above.

Since the new regime started, all have done better than expected in a profit (loss) before interest thanks to surprisingly increased traffic volume, though it is next to impossible to know how much increase of volume should be attributed to either managerial efforts or the coincidental economic boom. For whatever reason, the profitable three mainland companies have earned more than expected, while the unprofitable three island companies have lost less than expected in rail operations. The initial policy goal that the inefficient national rail service be vitalized under the incentive-compatible scheme seems to have been accomplished.

However, the story is not that simple. Since the early 1990s, interest rates in Japan have fallen off to a historically unprecedented level due to the deep and prolonged recession, the so-called *Lost Decade*. As is deciphered in Figure 6, not just nominal rates but also real rates have been decreased. The Bank of Japan set its overnight rate near zero in 1999 and still maintains this zero-interest-rate policy as of June 2006 though Japanese economy has been apparently recovering since 2002.

Japan's extremely low interest rates, which no one expected to happen when the JNR reform started, have affected the profitable three and unprofitable three regional companies in diametrically opposite directions. For the former, a reduced amount of interest *payment* have increased their profits after interest and taxes, while, for the latter, a reduced amount of interest *income* has led to the decrease of their profits and in some years resulted in a net loss after interest as pointed out in Section 3. An initially set target return, 7.3 percent per annum, is now impossible to attain without taking risks aggressively (which is prohibited anyway). Even a two percent return would not be an easy goal in Japanese bond markets at the moment.

Should the government implement some discretionary adjustment to initially set parameters ex post, in order to curb an unexpected and uncontrollable change of such macroeconomic conditions as market interest rates affecting one group and the other differently? Indeed, though it is difficult to decipher from publicly available information[16], the

[16] Kakumoto (2005) first clarified this scheme publicly based on a governmental information disclosure initiated by one of the authors (Fukui). We would like to make it clear that we never use any inside information, though former and current employees of a regional passenger company (JR East) we are. We will send a copy of the disclosed official document

Japanese Government has devised a clever but not transparent program to mitigate this unexpected income transfer of a kind. Under a semi-secret de facto order of the government, the profitable three are forced to borrow at artificially high interest rates from the unprofitable three through the JNR settlement account of Japan Railway Construction, Transport and Technology Agency (JRTT, formerly JNRSC), which can be considered a Special Purpose Vehicle (SPV) making this obscure transaction off-balance[17].

JR Hokkaido, for example, would have lost nine billion yen before taxes if it had earned market returns (two percent) on its financial fund in 2004[18]. But, thanks to returns on 0.5 trillion yen loan to the mainland rail companies through JRTT at artificially high 4.4 percent, JR Hokkaido made a *profit* of seven billion yen (three billion yen after taxes).

The three island companies in total received roughly 20 billion yen additional interest income from the mainland companies. In short, the lucky three mainland companies subsidize the unlucky three island sisters through the backdoor.

## 5. What to Be Done? Inter-Regional Adjustment of Profitability

It is always a contentious issue for regulators in a dynamic context to distinguish what to be retained from what to be returned to the public when regulated companies make an unexpectedly large profit (or loss)[19]. Suppose a privatized provider of monopolistic service is to be under a new price-cap regulation[20] with a predetermined X factor based on estimated prospective efficiency gains. Then the privatized monopoly under this regime makes an enormous profit beyond any reasonable expectation due to a sudden favorable technological shock. Should the government adjust the X factor upwards to “return” part of the unexpected gains to consumers? If it did, the regulated monopoly would lose an incentive to enhance its

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upon request (written in Japanese only).

[17] We leave it to the reader to judge how different this opaque practice is from Enron’s misuse of SPV to deceive investors.

[18] We cannot use the latest 2005 data because JRTT has yet to make public its 2005 financial performance.

[19] A pioneering work concerning regulation on the risk and value of the regulated entity in a dynamic context is Brennan and Schwartz (1982).

[20] See Linhart and Radner (1992) and Schmalensee (1989) for theoretical arguments on price-cap and rate-of-return regulations. Many important articles on price-caps are featured in the Autumn 1989 issue of the *RAND Journal of Economics*, which includes Schmalensee (1989). See Shleifer (1985) for yardstick regulation, which is a promising regulatory device if there are a sufficient number of similar operators in an industry.

productivity anticipating their efforts, once realized, being sacrificed for political expediency. Such a phenomenon is what happened in the regulation of the privatized British Telecom as described in Vickers and Yarrow (1988).

What makes it difficult to adjust afterwards is the fact that we usually can not distinguish managerial efforts unequivocally from factors external to management. Therefore, it does not seem to be the case that we reach any consensus both theoretically sound and politically feasible on how to divide the fruit of efficiency gains.

However, our case of unexpected market interest changes is an exception because no one denies that economy-wide interest changes are beyond control of any business organization, and their effects can be measured innocuously. Therefore, it is not unreasonable for the island companies to ask for some outside help to compensate for this unexpected negative shock. But, who should take responsibility for lowered interest rates?

The three mainland companies are seemingly a natural candidate to support their unlucky sisters because the former have been favorably affected by lower interest rates. Well, are they? All of the three have been separately privatized with their own shareholders independent of each other and unrelated to the three island companies (at least in terms of share ownership). Therefore, the current almost hidden and forced income transfer certainly leads to a conflict of interest among related stakeholders. It seems all the more serious because those who trust the government investing in the three privatized companies apparently lose in this semi-secret deal. If some transfer agreement in case of an unexpected situation existed when privatized, the shareholders of the mainland companies would have to accept a payment to the island companies because the payment should be a mere execution of the known agreement. But such a contract is non-existent.

Given the initial scheme which lacks any explicit terms of ex post adjustment on Management Stabilization Funds, the government would be the only entity expected to compensate for reduced interest income of the island companies. Instead, the government has used its political muscle to force the mainland companies to aid their unlucky sisters through the backdoor. Though privatized, the mainland ones cannot but acquiesce to governmental pressure because the government has substantial leverage over rail companies with its legally endorsed supervisory authority.

We do not think such an opaque and hardly justifiable policy is consistent with either the spirit of the JNR reform or the current trend towards open and fair governmental actions.

However, neither the government should fully compensate for the shortfall induced by lower than expected interest rates because the island companies have room to make themselves leaner by a means untried yet though anticipated right from the start: abolishing barely used local lines which bleed their operators.

Were JNR divided into several regional legal entities but wholly owned by a single holding company (whether privatized or not), the ex post profitability adjustment could be understood as transferring money between two purses of the same owner, i.e., a common parent company. Although the hard budget constraint is a sine qua non for resolving excessive unprofitable investment, lack of work discipline, and lack of managerial independence, and the establishment of regional entities is also necessary for realizing each region’s full potential, the separate privatization of each regional company may not be the only solution to tackle these problems. However, though a holding company system is now a very popular corporate governance device in Japan, it was heavily regulated and could not have been considered a viable option when the JNR reform was planned.

Since the new regime started in 1987, the downward trend of traffic volume in the three islands has been held back despite continuing motorization (Figure 5). This apparent stability has been brought about by opposing forces, increasing volume in urban areas and declining one in rural areas, though the accelerating trend in the latter has become dominant, particularly in the island of Shikoku, recently.

In spite of this dire situation, the three island companies seem to try to maintain their existing networks. At the least they ask for and are given outside help before abolishing any financially bleeding local line. This situation is difficult to justify considering the fact that even the public entity, i.e., JNR, was allowed to abolish many local lines in its last days because more convenient and efficient bus services could substitute for those lines. A conspicuous lack of any concrete plan for the abolition of barely used local lines which have few, if any, externalities for either society or an entire rail network is a serious defect of the JNR reform. This defect has been exacerbated by the separate privatization of the three mainland companies, which makes inter-company adjustment problematic because new stakeholders, private shareholders, have come on the scene.

However, regulatory environments have recently become more favorable than before. Under the amended Railway Business Law, which covers both ex-JNR and non-JNR companies, rail companies can terminate operations after submitting a notification to the government one year ahead. This amendment has significantly reduced the burden of rail companies because rail operators had to obtain the permission of the government to terminate their operations before this amendment coming into effect in 2000.

Many local lines in the three islands no longer play any meaningful role for communities and the abolition of those comparable to former Special Local Lines in traffic volume now must be taken seriously. Unless this overdue homework is tackled, it is difficult to justify any additional aid to the island companies as a sound public policy.

Moreover, we cannot escape from the fact that rail operations in the three islands are not viable business unless all but few urban lines are abolished[21]. Otherwise, taxpayers' money in the form of Management Stabilization Funds would be unnecessary. In a sense, the privatization of the island companies is more impermissible than improbable because the best policy for private investors is to abolish as many rail lines as possible and take financial income away from the funds. This scenario is not a theoretical fantasy. Indeed, a famous hedge fund nearly succeeded in acquiring a non-JNR listed rail company in Osaka to cash in on its real property.

Neither the three mainland companies are free from the problem of unprofitable local operations. Each mainland company, though profitable as a whole, has many unprofitable lines of its own. Actually, Most of the extensive networks of JR East and JR West, the largest two of the six regional companies, are unprofitable local lines. The incurable problem of decreasing traffic volume is almost invisible to the public simply because extremely profitable urban lines more than compensate for a huge loss in local lines. If interest rates had gone up unexpectedly, the mainland companies instead of the island ones would have made a loss leading to the abolition of unprofitable lines in the mainland.

It is noteworthy that the privatized mainland companies face more strict but vague regulations on the termination of local rail operations. Under the JR Law, which came into force when JNR was dissolved, JR companies had to comply with additional regulations on long-term debt financing, appointment of representative directors, submission of annual business plans, etc., which were not applicable to non-JNR rail companies. Then, an amendment to the JR Law came into effect in 2001, which excludes the three mainland companies from the regulations based on the law. However, this amendment mandates the government to issue several guidelines in place of the previous regulations. One of them is

[21] There may be no line left for JR Shikoku, though.

related to “the appropriate maintenance of the currently operated railway routes in light of the trend of demand for transportation and other changes in circumstances following the implementation of the reform of JNR”. Accordingly, the government is legally entitled to guide and advise the three mainland companies, and issue recommendations and orders if it judges the three mainland companies do not comply with any guideline. Therefore, it does not seem easy, though not impossible, for the mainland companies to cease unprofitable local operations[22].

In sum, unexpected interest changes now force us to squarely face our day of reckoning, though delayed by unexpectedly favorable circumstances just after the reform began. The island companies have no choice but to start to curtail their respective networks, though the mainland companies are plagued with the same problem. To put briefly, unless bleeding rural lines are slashed, subsidy compensating for decreased interest income on Management Stabilization Funds will become window dressing to conceal the unsustainable nature of the current rail operations in their entirety.

If any island company could not break even after full-blown efforts, it might be an incentive-compatible and sensible policy for the government to exchange the current financial assets of the island companies for long-term fixed-interest inflation-protection (say, four percent real rate) government bonds, which can avoid any debacle brought about by future unexpected interest changes. In addition, a partial disposition of the principal, though now forbidden, is not out of the question anticipating the possible termination of rail operations in the future.

## 6. Conclusion: Half Empty? Half Full?

To recap the five major reasons why JNR failed and an entirely new scheme was being sought, (1) JNR was forced to invest excessively in unprofitable new projects by politicians; (2) radical labor unions indifferent or even hostile to the viability of the employer destroyed the morale and discipline of employees deterring passengers with poor customer service; (3) top management was devoid of responsibilities to manage JNR independently and above all lacked a profit motive; (4) the national rail network no longer constituted a meaningful unit and its centralized control became obsolete and inefficient; and (5) there were

[22] JR West, the least profitable of the three mainland companies, has already abolished one of its unprofitable lines.

too many unprofitable lines to be sufficiently cross-subsidized by a shrinking number of profitable lines.

The JNR reform should be judged on whether these five problems have been resolved or at least tackled earnestly. Indeed the first three problems, excessive unprofitable investment, lack of work discipline, and lack of managerial independence, have been effectively resolved by the introduction of the hard budget into rail operations.

The fourth problem, inefficient centralized control, has been substantially remedied through the establishment of regionally separate legal entities which cater to respective customer needs.

All in all, we may safely conclude that the first four problems have been successfully resolved by the JNR reform though not perfectly. However, the fifth and last problem, the adjustment of regional profitability differentials, still haunts the regional companies as well as the government.

In hindsight, one of the most serious defects in the JNR reform is a lack of any concrete plan for the abolition of financially bleeding local lines which have few, if any, externalities for either society or an entire rail network. But, no reform is perfect. Content with respectable results of the JNR reform, we should continue to adjust ourselves to changing conditions surrounding Japanese railroads. Some argue we have been too mesmerized with more than expected initial results to consider a next step seriously in a timely fashion. They may be right, but better later than never.

**Appendix: Details of the JNR Reform**

(1) Privatization of the Newly Established Companies

JR East first got listed on Tokyo Stock Exchange and others in 1993, and completely privatized in 2002. JR West was fully privatized in 2004, and JR Central in 2006. However, there is no concrete schedule for the public offering of the remaining three passenger rail companies, JR Hokkaido, JR Shikoku and JR Kyushu, and the freight company, JR Freight.

(2) Debts Assumed by New Companies and Remained in the Hands of JNRSC

When the new regime started in 1987, the total amount of liabilities to be disposed of was 37.1 trillion yen consisting of 25.1 trillion yen piled up by JNR, 4.5 trillion yen incurred by Japan Railway Construction Public Corporation, a government-owned corporation established in 1964 to construct new rail lines including new *Shinkansen* routes, 5.0 trillion yen pension obligation for retired JNR employees, 1.3 trillion yen Management Stabilization Funds set up for the three unprofitable passenger companies, etc. The three mainland passenger rail companies and the freight rail company (the latter owes a much smaller amount though) inherited 14.5 trillion yen liabilities from JNR, and JNRSC assumed responsibility for the remaining 22.7 trillion yen. It was expected at the time that JNRSC would finance 8.9 trillion yen from the sale of assets such as real property succeeded from JNR and the shares of the newly established companies, while the remaining 13.8 trillion yen would be owed by tax payers. Although new rail companies have rapid faster than planned, JNRSC had been far behind schedule in repayment, which resulted in an increased amount of debts ten years later. In 1998, the National Diet passed a final piece of legislation transferring almost all of the 28.3 trillion yen debt then outstanding from JNRSC to the general account of the Japanese Government.

(3) Deployment of Ex-JNR Employees

As of April 1986, a year before the JNR reform, the number of JNR employees was 277,000. During the last year of JNR, 47,700 employees left JNR voluntarily or at a retirement age then (55 years old). The new companies hired 203,100[23] ex-JNR employees, while 18,600 were transferred to various public sectors such as police and tax authorities. The

[23] This number includes employees of JNRSC to be engaged in completing the liquidation of JNR.

remaining 7,600 were expected to find new jobs with the help of JNRSC's job search program within three years. By the end of March 1990, 3,440 found new jobs and 2,300 were additionally hired by new companies, while the remaining 1,890 either retired or got fired.

(4) Management Stabilization Funds

Described in the main text.

(5) Revaluation of the *Shinkansen* Lines

The Tokaido *Shinkansen* line, which was constructed earliest and had the least book value, has been much more profitable than the other three new lines, the Sanyo, Tohoku, and Joetsu lines, though the same fare system was used in the days of JNR. If fares were set to reflect respective cost structure, they would diverge unbearably for passengers accustomed to a uniform rate. It is said that three schemes to avoid this divergence was considered: (1) Transferring revenues among the three *Shinkansen* operating companies to adjust profitability differentials; (2) revaluing *Shinkansen* assets line by line based on profitability, and allocating liabilities accordingly; and (3) establishing a *Shinkansen* assets holding entity and letting the operating companies lease the assets and pay a fee based on traffic volume. The third mechanism was adopted and the wholly government-owned SHC was founded.

The book value of the *Shinkansen* assets as of the last day of JNR was 5.7 trillion yen consisting of 0.5 trillion yen for the Tokaido line, 0.7 trillion yen for the Sanyo line and 4.5 for the Tohoku and Joetsu lines. Immediately after the dissolution of JNR in April 1987 when the *Shinkansen* assets were transferred to SHC, they were revalued and increased by 2.9 trillion totaling 8.5 trillion yen: the Tokaido line (operated by JR Central) was revalued to 5.0 trillion yen, the Sanyo line (operated by JR West) to 1.1 trillion yen, and the Tohoku and Joetsu lines (operated by JR East) to 2.4 trillion yen.

However, this scheme was widely attacked, especially JR Central was vocal claiming (1) the *Shinkansen* operating companies were denied to set aside internal capital free of tax with depreciation for the maintenance and future reconstruction of the *Shinkansen* infrastructure (this argument is not valid though); (2) a lease payment based on traffic volume would discourage operators to make efforts to increase passengers; and (3) the lack of terms on final settlements at the end of the 30-year lease period as well as an uncertain prospect of future lease payment would make the future of operating companies too opaque for privatization.

Although the first claim was dubious at best, the second and third assertions pointed out a fundamental weakness of the scheme. Responding to mounting criticism, in October 1991, four and a half years after the dissolution of JNR, the three mainland rail companies purchased respective *Shinkansen* assets from SHC at the price then revalued again based on newly estimated profitability. The new policy meant the second mechanism mentioned above have finally won over. When purchased, the *Shinkansen* assets on the balance sheet of SHC were reduced to 8.1 trillion yen due to four-year depreciation. However, 1.1 trillion yen was added to the book value totaling 9.2 trillion yen: JR Central paid 5.1 trillion yen for the Tokaido line, JR West 1.0 trillion yen for the Sanyo line and JR East 3.1 trillion yen for the Tohoku and Joetsu lines. The government has earmarked an add-on of 1.1 trillion yen for constructing planned *Shinkansen* and other rail facilities.

## References


Brennan, M. J., and E. S. Schwartz. 1982. Consistent Regulatory Policy under Uncertainty. *Bell Journal of Economics* 13 (2): 506-521.

East Japan Railway Company. 1995. *The Privatization of Railways in Japan.* Tokyo, Japan: East Japan Railway Culture Foundation.

Glaeser, E. L. 2003. Introduction. In E. L. Glaeser (ed.). *The Governance of Not-for-Profit Organizations*. Chcago, U.S.A.: University of Chicago Press.

Kakumoto, R. 2005. *Mittsu no Min'eika*. Ryugasaki, Japan: Ryutsu Keizai Daigaku Shuppankai.

Kornai, J. 1986. The Soft Budget Constraint. *Kyklos* 39 (1): 3-30.

Kornai, J., E. Maskin, and G. Roland. 2003. Understanding the Soft Budget Constraint. *Journal of Economic Literature* 41 (4): 1095-1136.

Linhart, P. B., and R. Radner. 1992. Price Caps. *Annals of Operations Research* 36: 17-32.

Schmalensee, R. 1989. Good Regulatory Regimes. *RAND Journal of Economics* 20 (3): 417-436.

Shleifer, A. 1985. A Theory of Yardstick Competition. *RAND Journal of Economics* 16 (3): 319-327.

Vickers, J., and G. Yarrow. 1988. *Privatization: An Economic Analysis*. Cambridge, U.S.A.: MIT Press.

Winston, C. 2000. Government Failure in Urban Transportation. *Fiscal Studies* 21 (4): 403-425.

Figure 1: International Comparison of Population Density

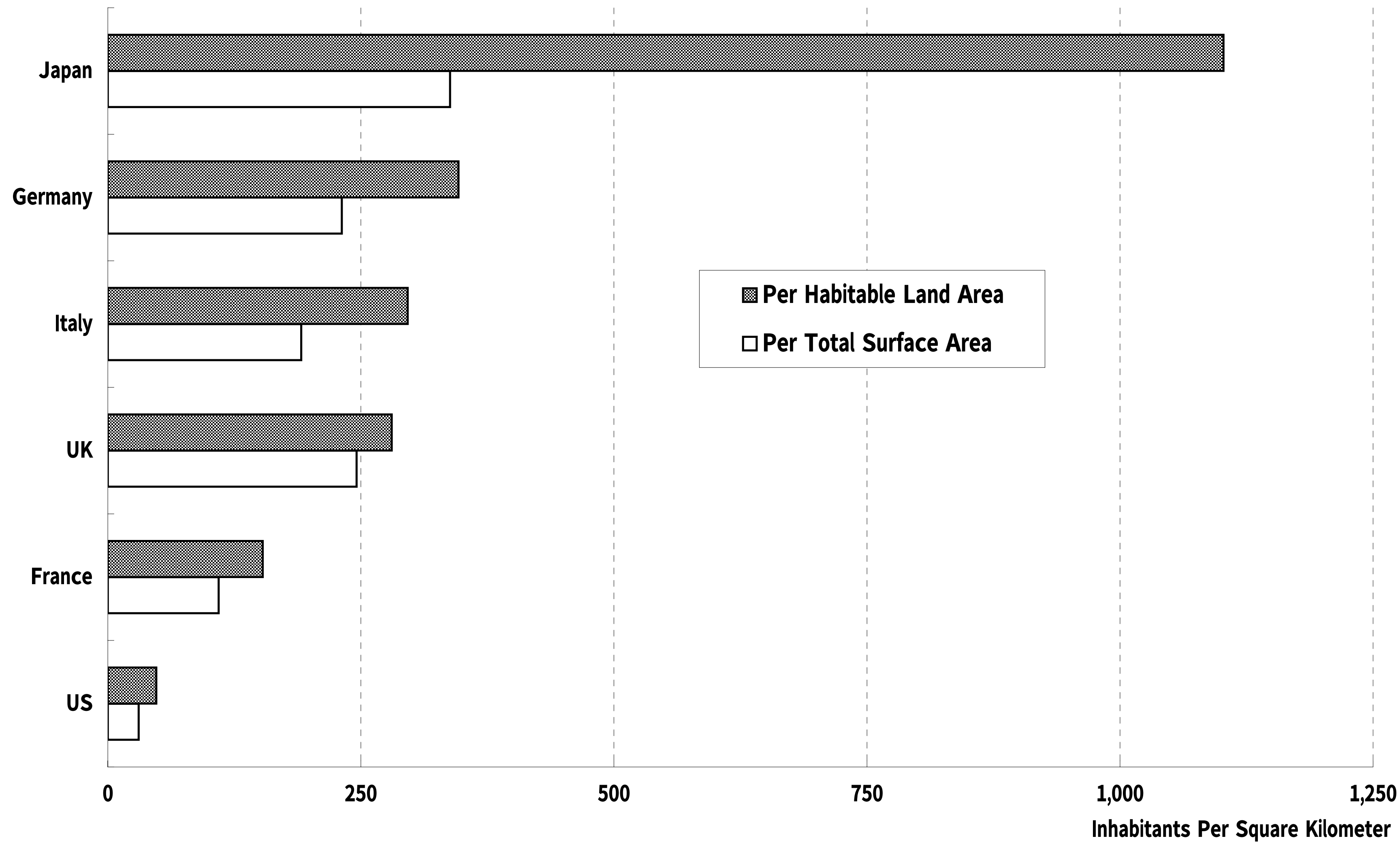
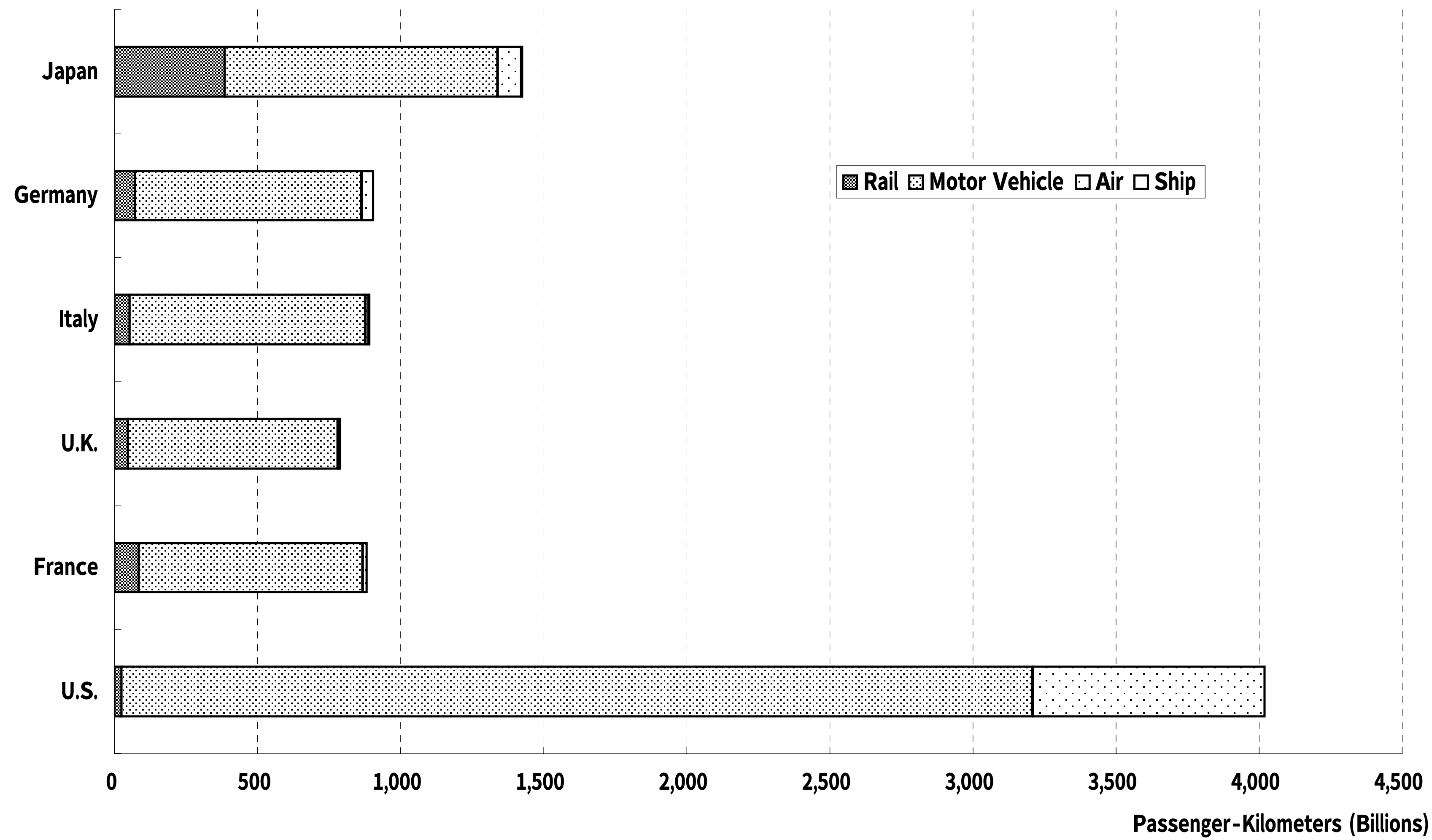
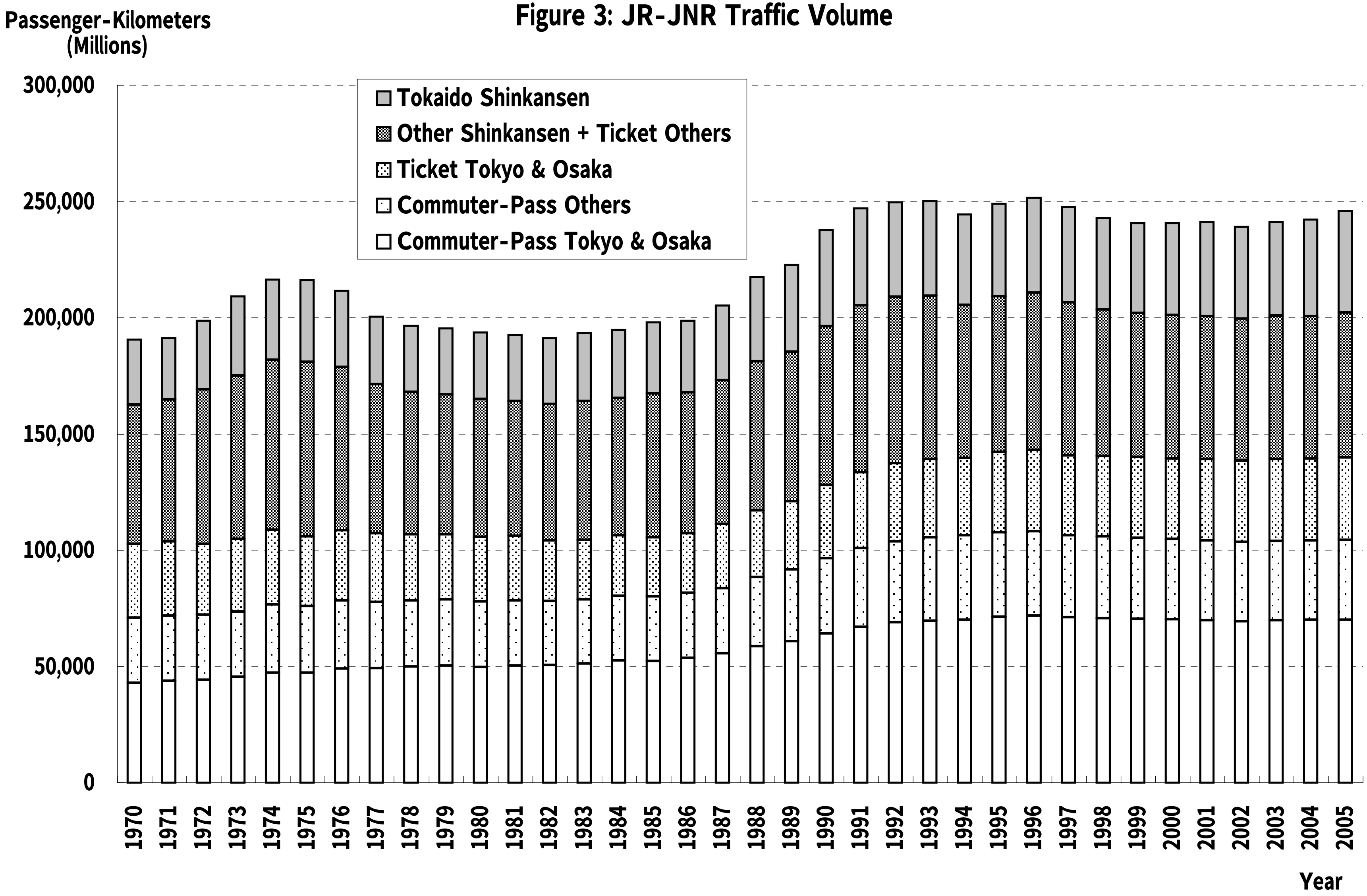


Figure 2: International Comparison of Domestic Passenger Traffic Volume



## Figure 3: JR-JNR Traffic Volume



## Figure4: Mainland Traffic Volume

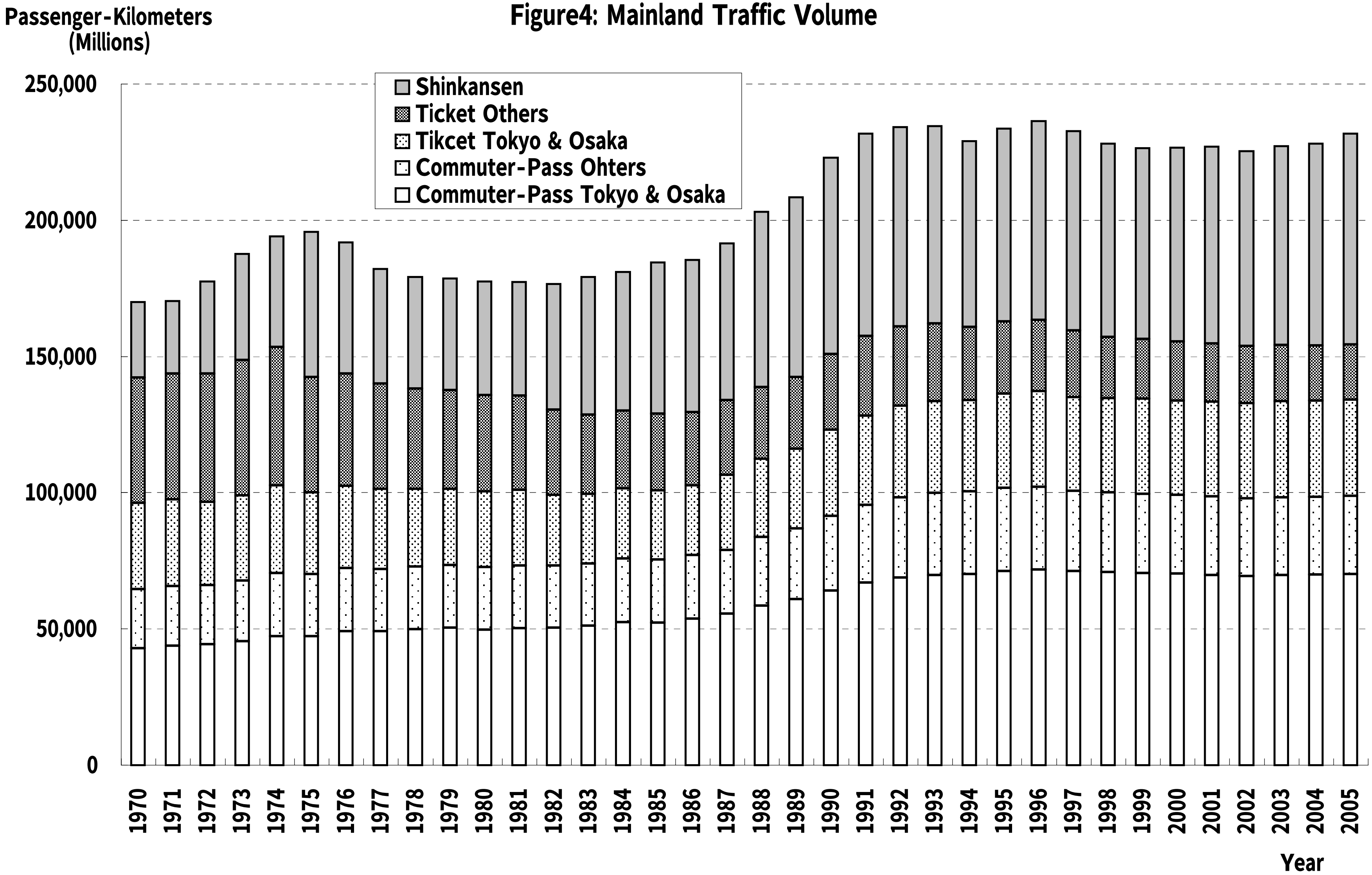
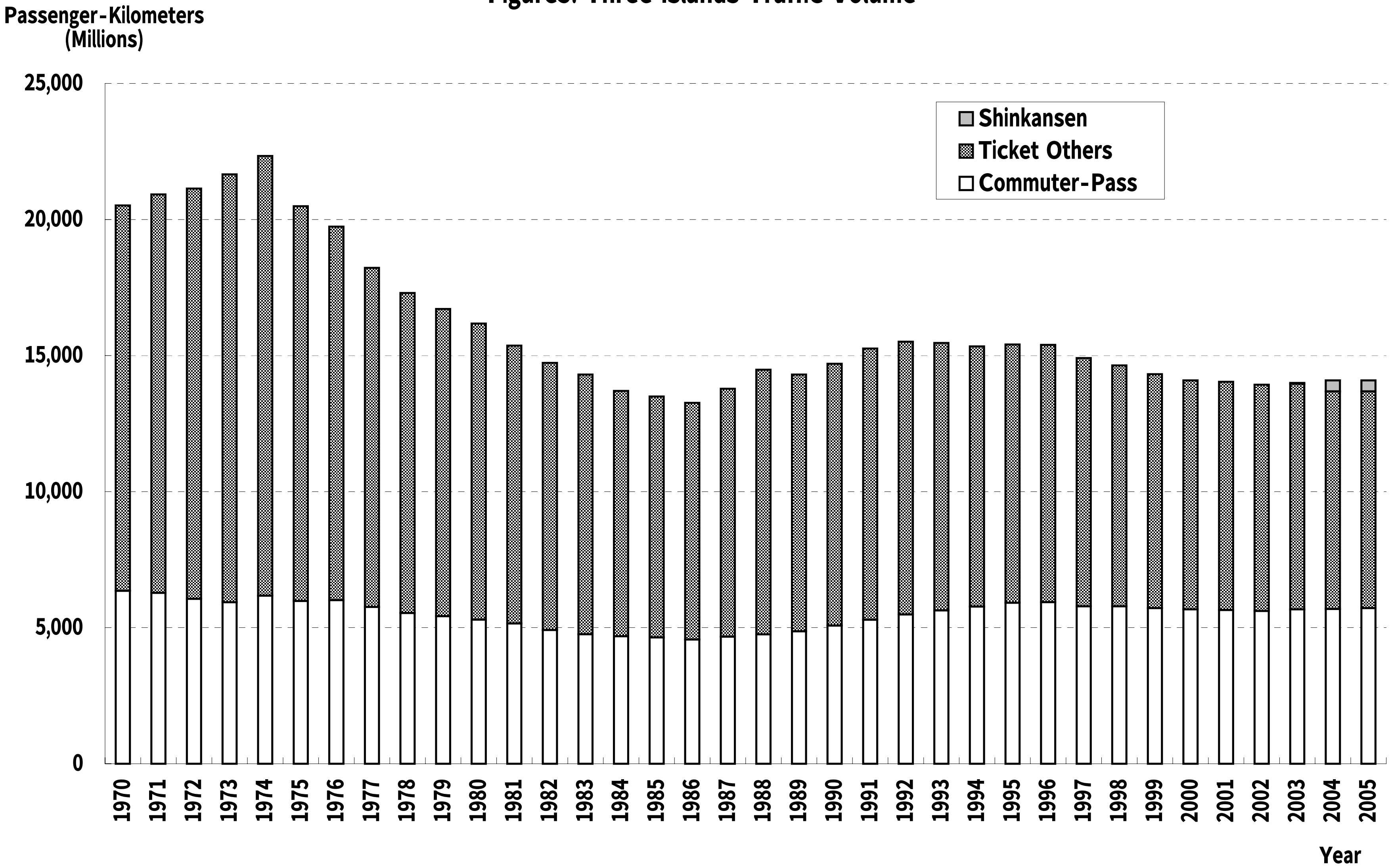


Figure5: Three Islands Traffic Volume



## Figure 6: JGB Yield and CPI