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 dissolved in 1987 after piling up huge debts. JNR was not only dissolved but also divided into six regional companies, of which three have inherited debts as well as assets but the other three in sparsely populated areas have inherited only assets and been given financial assets. The latter three were expected to lose money in rail operations but make up for the loss with financial income. However, Japan's low interest rates have jeopardized this seemingly ingenious scheme. Then, who should take responsibility for unexpected interest changes?

Keywords

Japanese Railroad, Privatization, Deregulation, Hard Budget Constraint, and Incentive-Compatibility

Since the first passenger train ran between Tokyo and Yokohama in 1872, the Japanese Government and private companies have progressively 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, 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, which began to offer service 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, 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 1).

Figure 1 Inserted

The above mentioned environments suggest the failure of JNR should be due more to mismanagement under poor governance mechanism than to 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 succeed under relatively favorable circumstances? First, politicians forced JNR to construct many unprofitable new lines without any compensating subsidies. Second, major unions, which were extremely hostile against management, devastated the morale and discipline of employees making customers abandon JNR. Third, even top managers, who were not given full responsibilities of control, 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 serve public interest nor a for-profit corporation 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, these managers finally succeeded to implement the JNR reform.

We summarize the JNR reform in Section 1 and the operating performance of regionally divided rail companies under the new regime in Section 2. In Section 3 we describe an unsettled issue of the reform, inter- and intra-company profitability adjustment, and consider its policy implications in Section 4. Section 5 is a brief conclusion.

1. What Was Implemented? JNR Reform

The JNR reform in April 1987 mainly consisted of the following five specific measures [1] :

(1) JNR was broken up into seven Japan Railway (JR) companies which consist of six regional passenger rail companies and one freight rail company. 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. JNR operated a rail service in the three islands of Hokkaido, Shikoku and Kyushu, as well as Honshu, the mainland. Three regional passenger companies, Hokkaido Railway Company (JR Hokkaido), Shikoku Railway Company (JR Shikoku) and Kyushu Railway Company (JR Kyushu) have been set up for the three islands (hereafter Island Companies). Because the mainland is much larger than the three islands including the three largest metropolitan areas, Tokyo, Nagoya and Osaka, a rail service in the mainland has been further divided into three regional passenger 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 (hereafter Mainland Companies).

(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, 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) Because the *Shinkansen* lines operated by JNR were not uniform in their profitability, the assets in their entirety were to be held by the wholly government-owned *Shinkansen* Holding Corporation (SHC), and the three Mainland Companies leased the facilities paying usage fees determined by SHC according to traffic volume. 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.

(5) Extra financial funds called Management Stabilization Funds were set up for the three Island Companies. They were expected to cover their loss in rail operations with interest income from the funds.

The five measures reflect a distinctly Japanese situation concerning rail transportation. In Japan, private non-JNR passenger rail companies have extensive networks in Tokyo and Osaka, and their combined traffic volume is about 40 percent of ex-JNR companies' exceeding that of the entire French National Railways (SNCF). They have been profitable for years despite the burden of construction cost, which may astound some readers because urban rail operations are generally money-losing outside Japan (Winston 2000). In addition, since their networks were partly connected with JNR's, numerous trains ran directly thorough JNR and non-JNR (including subway) lines before the reform, not to mention the fact that they do after the reform.

Due to the existence of fully integrated profitable private rail companies as well as an exceptionally high demand for a passenger rail service in general, the Japanese Government decided not to adopt a European-style policy to separate the provision of transport services from the operation of infrastructure (Council of European Communities 1991), but to maintain the vertical integration of railroad operations. Instead the government divided the national rail network horizontally when JNR was dissolved. Because an airplane is a dominant choice for a longer domestic trip in Japan, a passenger rail service is mostly for short- to medium-distance trips. Therefore, it was a consensus that negative effects of a nationwide centralized organization outweighed positive externalities of a larger integrated network when the JNR reform was contemplated. That is, the larger the network, not necessarily the better. The basic philosophy of the Japanese reform has some affinity with the idea of an optimal currency area (Mundell 1961).

How to divide the national network was the most debated part of the reform in order to maintain positive externalities and simultaneously realize more customer-oriented management as much as possible. While there was no question that each of the three islands was a natural unit, countless patterns of the mainland division were considered. Finally, the mainland operation was divided into three geographically integrated and operationally independent units. Consequently, the adopted division would enable more than 95 percent of passengers to complete their trips within the boundaries of each regional unit (East Japan Railway Company 1995, p. 12), beyond which nonetheless many direct trains would run under the new regime as in JNR's days.

Another aspect uniquely Japanese is that the reform concentrated on a passenger service treating a freight service as an appendage. Although why a freight service has been separated from the six regional companies is not entirely clear then and now, unlike North America and Europe, the share of railroad in freight traffic volume was insignificant in the mid-1980s. Because most of the major industrial centers are located on the coast, and virtually all fuels are imported, coastal shipping carrying what would be done by rail in other countries splits nearly equally the Japanese freight market with trucking. Since its inception, Japan Freight Railway Company (JR Freight) has been paying usage fees based on avoidable (short-term marginal) cost to the passenger companies which own rail lines. 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 in this paper partly because its size is minuscule (less than five percent) compared to that of a passenger service in terms of revenues.

In a sense, the spirit of the Japanese reform bears some resemblance with that of the North American one. One part should be profitable enough to maintain infrastructure on its own if designed properly, while the other part is not much expected. The crucial difference is, however, that a passenger service plays a vital role in Japan, a freight one in North America.

Although each of the five measures was instrumental in realizing the JNR reform, the fifth and last one is directly relevant to our main concern, inter-regional profitability adjustment.

When JNR was divided into six regional passenger rail companies, the three Mainland Companies, 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. On the other hand, the other three Island Companies 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.

In order to tackle this profitability differential, three possible schemes were considered: (1) giving governmental subsidies 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 was 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.

2. Did the Reform Go Well? Operating Performance since JNR Dissolution [2]

Before the new regime started in April 1987, the government made public an aggressive five-year forecast. It was 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 it.

Although the structural reform undeniably contributed to good performance, the gods surely smiled on passenger companies. 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 2). 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. Moreover, airport and highway networks have been remarkably expanded since the passenger rail companies started to operate in 1987. In short, 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, the three Mainland Companies continue to make profits except JR West in 1998 [3] without any fare rise [4] thanks to stable traffic volume (Figure 2). With their steady performance, they have got listed on the 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 Island Companies seem to struggle to make ends meet though they have successfully resisted the once definitely downward trend of traffic volume (Figure 2) since the new regime started in 1987.

Figure 2 Inserted

3. What Remains to Be Resolved? Two Decades After

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, Maskin and Roland 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 [5]. Because competition with other transportation means such as automobiles and buses is fiercer in the sparsely populated three islands than in the mainland, 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 outside intervention. In a sense, privatization is a commitment device to harden the budget constraint (Stiglitz 1994, pp. 179-180). 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 in contrast to the Island Companies which lack 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.

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 has been.

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

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-subsidization 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 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 Companies. As mentioned in Section 1, 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 letting the regional companies keep all what they would achieve and not be given any additional help under the new regime.

Although the rail operation of the mainland is profitable as a whole thanks to large traffic volume, that of the 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 and to abolish a vast majority of the lines in the three islands. On the other hand, a governmental commitment to continual subsidies would lead to inefficient management and 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.

The mechanism was then considered incentive-compatible because (i) the profitable three Mainland Companies would have to pay the debts but amass more profits than expected should they enhance their efficiency, and (ii) the unprofitable three Island Companies could earn profits should they lose less money in rail operations than expected and earn interest income on their financial assets. The financial and operating structure of the Mainland and Island Companies is depicted in Figure 3.

Figure 3 Inserted

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 likely candidate, a governmental pre-commitment to annual fixed subsidies, 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 shortly after the new regime started as mentioned above.

Following introduction of the new regime, all companies initially did better than expected in terms of 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. 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 4, not just nominal rates (JGB yields) but also real rates (JGB yields minus CPI) have decreased. The Bank of Japan set its overnight rate near zero in 1999 and still maintains a very low (less than one percent) interest target though Japanese economy has been apparently recovering since 2002.

Figure 4 Inserted

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* has 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. 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, the Japanese Government has devised a clever but not transparent program to mitigate this unexpected income transfer of a kind (Kakumoto 2005, pp. 175-176). 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.

The three Island Companies in total received roughly 20 billion yen additional interest income from the Mainland Companies. Because the amount far exceeded their combined income before taxes, they should have recorded a loss without these hidden subsidies. In short, the lucky three Mainland Companies subsidize the unlucky three island sisters through the backdoor.

4. What is to Be Done? Inter-Regional Adjustment of Profitability

It is always a contentious issue for regulators in a dynamic context to distinguish what is to be retained from what is to be returned to the public when regulated companies make an unexpectedly large profit (or loss)[7]. Suppose a privatized provider of monopolistic service is to be under a new price-cap regulation[8] with a predetermined X factor based on estimated prospective efficiency gains. Suppose 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 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 quite precisely. 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. Or 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 had existed when privatized, the shareholders of the Mainland Companies would have to accept a payment to the Island Companies because the payment would be a mere execution of the known agreement. But no such contract was signed.

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 Companies 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, nor should the government 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 halted despite continuing motorization (Figure 2). This apparent stability has been brought about by opposing forces, increasing volume in urban areas and declining volume in rural areas, though the accelerating trend in the latter has become dominant recently, particularly in the island of Shikoku.

In spite of this dire situation, the three Island Companies seem to be trying 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, 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 came 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.

Unprofitable local operations also haunt the three Mainland Companies. 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 instead of the

Island Companies would have made a loss leading to the abolition of unprofitable lines in the mainland.

It is noteworthy that the privatized Mainland Companies face stricter, albeit vague, regulations on the termination of local rail operations than do the Island Companies as well as non-JR companies. The government is legally entitled to guide and advise the three Mainland Companies, and issue recommendations and orders, if it judges that any of them is deviating either of the guidelines, one of which is related to "the appropriate maintenance of railway routes currently in operations reflecting trends in transportation demand and other changes in circumstances following the restructuring of Japanese National Railways" (East Japan Railway 2006, p. 48). Therefore, it seems difficult, though not impossible, for the Mainland Companies to cease unprofitable local operations [9] .

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. Unless bleeding rural lines are slashed, subsidies compensating for decreased interest income on Management Stabilization Funds will become window dressing to conceal the unsustainable nature of the current rail operations of the three islands in their entirety.

Should any or all of the Island Companies still find it difficult to break even after making full-blown efforts to slash as many lines as possible, it might be an incentive- compatible and sensible policy for the government to exchange their current financial assets 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.

5. 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, and deterred 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 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 constraint 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.

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[1] East Japan Railway Company (1995) is the most authoritative summary available in English for the JNR reform.

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

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

[4] Fares were adjusted twice due to the introduction of three percent consumption (value added) tax and its subsequent rise to five percent.

[5] Destatization, a concept used in the post-Soviet reform which means taking the assets out of the hands of the state but not selling them to private investors (Hewett 1990, p. 156), may describe the reform of the three island companies more aptly than privatization.

[6] Japan's national toll road networks have adopted a uniform rate. Due to high traffic volume in urban areas, road companies make a profit on the whole so far.

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

[8] 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.

[9] JR West, the least profitable of the three Mainland Companies, managed to abolish one of its most unprofitable lines in 2003.

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Figure 1: International Comparison of Domestic Passenger Traffic Volume

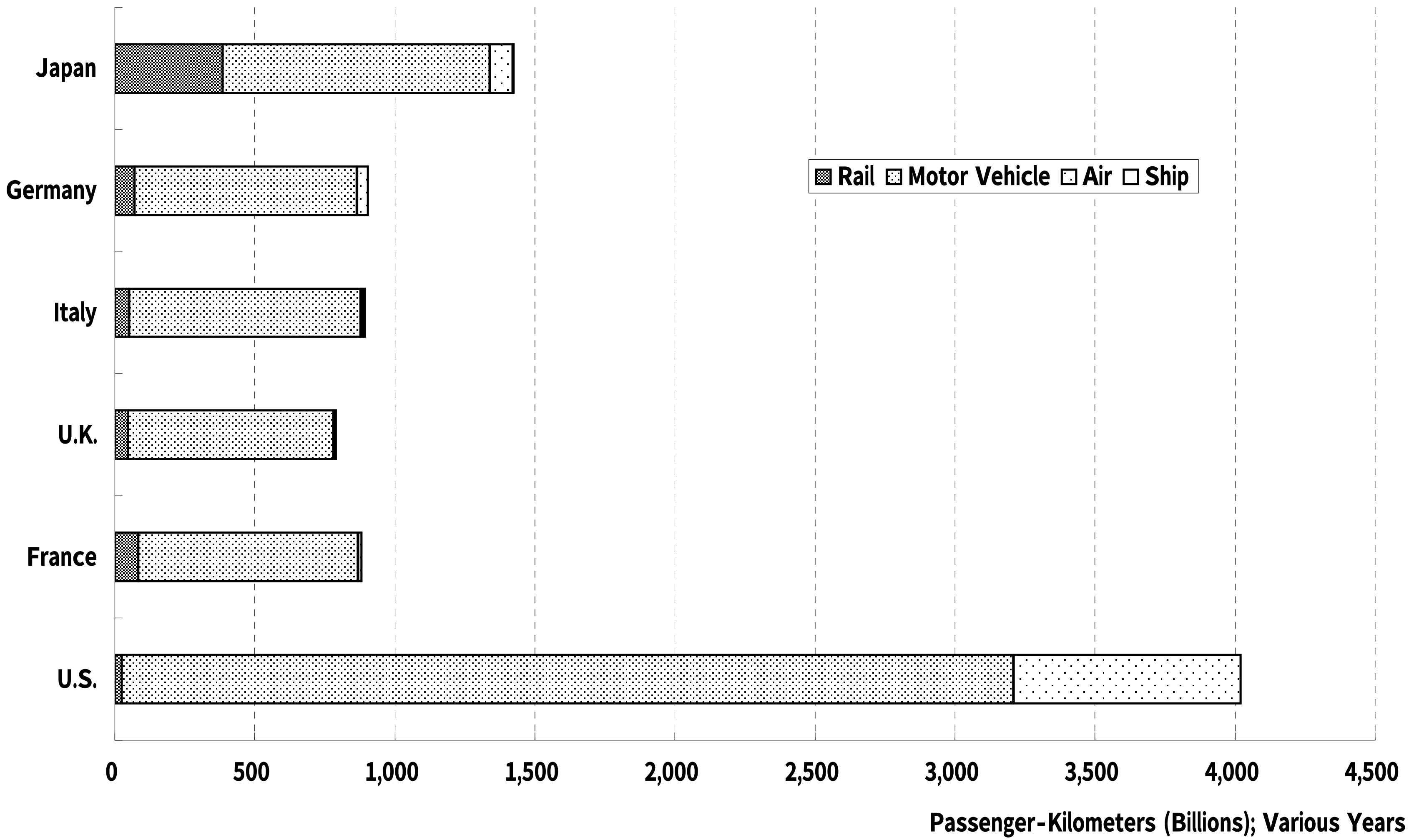

Figure 2: JNR-JR Traffic Volume

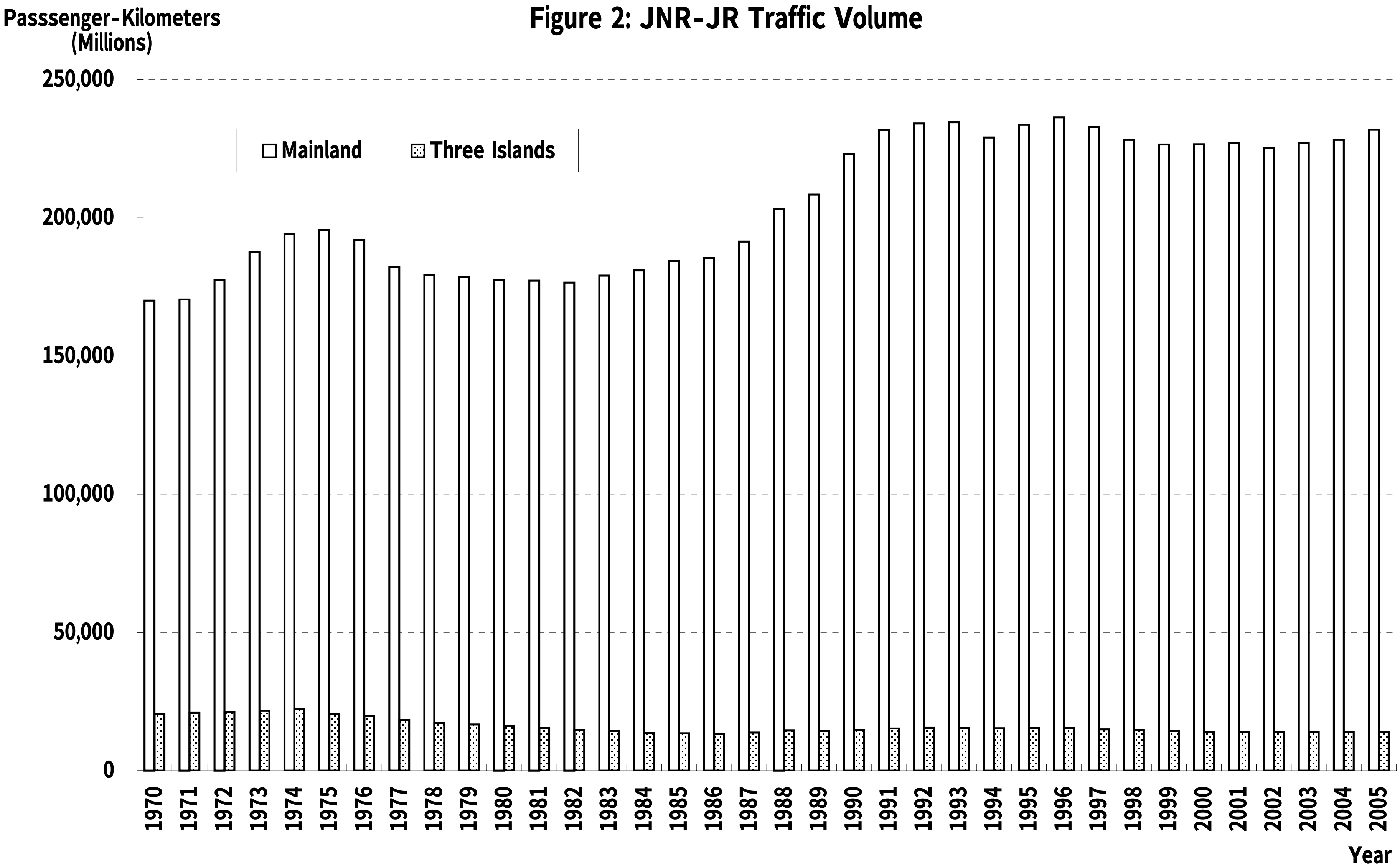

Figure 3: Financial and Operating Structure

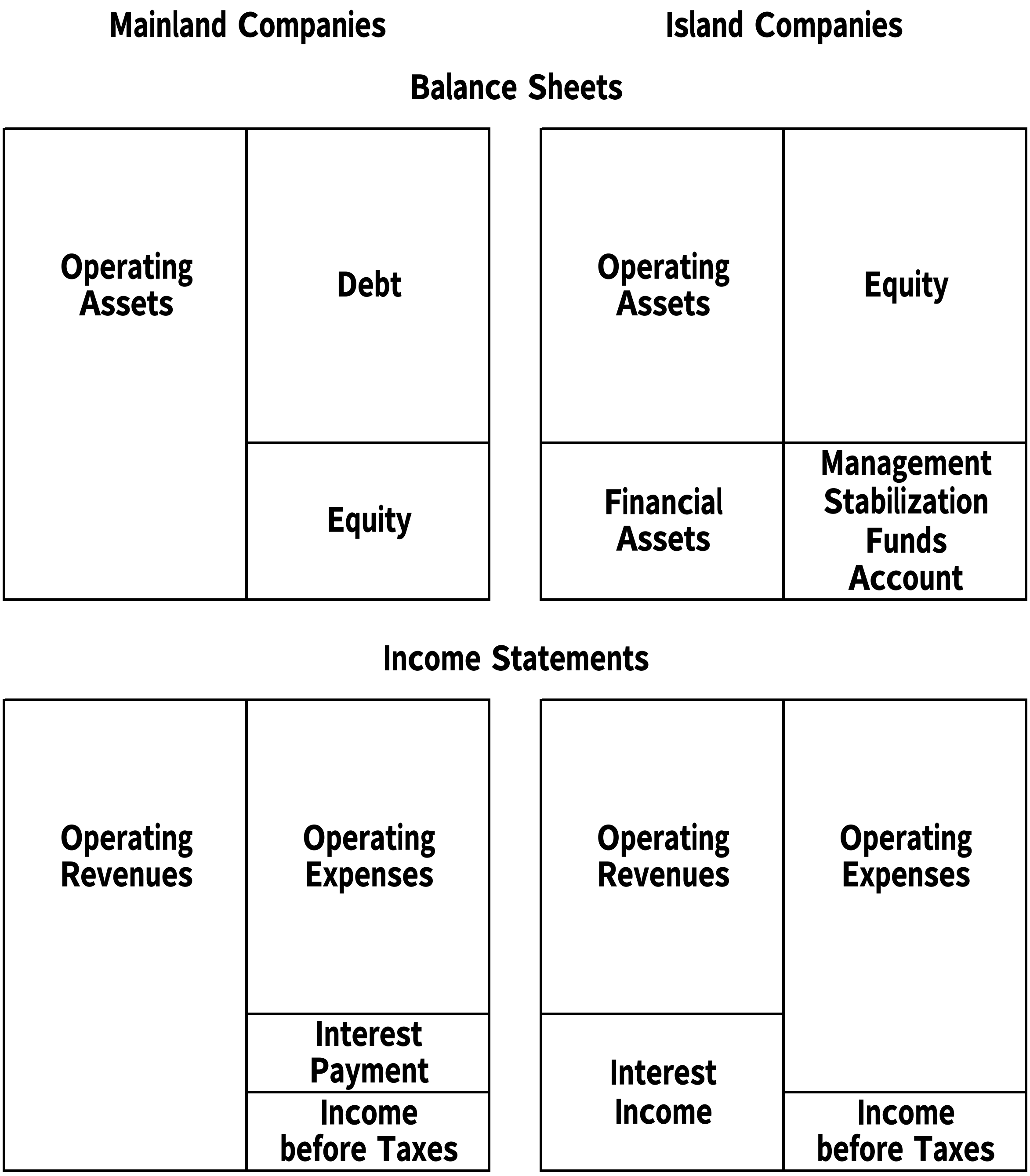

Figure 4: JGB Yields and CPI