Privatization Versus Public Works for High-Speed Rail Projects

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With its virtues of high speed, large capacity, reduced levels of energy consumption, and low levels of pollution, high-speed rail (HSR) is emerging as an attractive transportation system. Because of the large investment burden required for HSR projects and the inefficiency of government-sponsored public works projects, many countries are now turning to the alternative of privatizing their HSR projects. The present research evaluates the success of privatized versus public HSR projects by comparing the outcomes for the Taiwan high-speed rail (THSR) project and the South Korean high-speed rail (KHSR) project. Except for the project delivery method (privatized versus public works), these two projects had similar project scopes and objectives and had parallel execution times. The results of the study indicate that a privatized HSR project such as THSR has a better likelihood of achieving traditional project management success in terms of time, cost, and quality; however, a government-sponsored HSR project such as KHSR could successfully promote the national HSR industry.

With the world's oil resources gradually becoming depleted and global warming developing into one of the worst environmental threats to the survival of humankind, transportation authorities are seeking remedies to the existing forms of energy used for transportation. Less energy consuming and more environmentally friendly green mobilization alternatives can replace the now heavily gasoline-dependent vehicles used for land and air transportation. Many countries are turning to high-speed rail (HSR) systems as a solution to meeting their transportation needs for the 21st century (*1*) (Table 1). However, because of the large investment required for construction of HSR projects, authorities have started to look into the alternative project delivery method of privatization. Furthermore, the use of privatization is also considered a means of improving the inefficiency often associated with a government-sponsored public works project (referred to as a government works project in this paper).

The Taiwan high-speed rail (THSR) project is the world's first privatized project of its kind. When the THSR project was initiated in 1989, the work was originally planned to be a government works project. However, after completion of the detailed design in 1993, the Taiwan government chose to undertake an unprecedented approach and privatize the THSR project. Privatization was a way to introduce the private owner's financial and management capabilities into a traditional public works project. Because of the use of this unusual approach, the THSR project was put on hold for a while to allow the government to complete the regulations required for a build–operate–transfer (BOT) scheme. After it was completed in 1998, the government awarded the HSR project to a private concessionaire, the Taiwan High Speed Rail Corporation (THSRC).

When Taiwan was under economic development pressure to construct HSR in 1990, South Korea also decided to build its HSR system to ease the congestion on highways due to its rapid economic development. Unlike the THSR project in Taiwan, however, the South Korean high-speed rail (KHSR) project was executed as a traditional government-sponsored public works project.

It is coincidental that the two projects had similar objectives and scopes and that both were parallel in their execution. The major difference was the method of delivery: a privatized endeavor versus a government works project. Therefore, comparison of the delivery methods of these two projects provides a unique opportunity to explore the effect of privatization on HSR projects.

THE PROJECTS

Taiwan High-Speed Rail Project

Project History

Taiwan's rapid economic development from the 1960s to 1980s greatly increased the demand on its intercity transportation system. As a result, the only freeway that served the island's north–south corridor became overly congested. This congestion not only reduced the level of service of the freeway but also prevented the further development of Taiwan's economy. Many business travelers turned to domestic airline services for their travel needs; however, these short flights (less than 30 min) are not environmentally friendly or efficient; overuse of the airports also hindered the planned cross-strait airline services.

Another important transportation provider on this corridor is the conventional railway, operated by Taiwan Railway Administration (TRA). Several alternatives were considered to improve rail services. Among those alternatives, upgrading of the conventional railway was carefully studied. To increase the train speed and shorten the travel time on the conventional railway, studies evaluated the possibility of widening the narrow-gage railway or introducing tilting trains. Both technologies, however, were considered either too expensive or too inefficient. The construction of a high-capacity HSR system to serve the country's transportation needs became the only viable alternative (*2*).

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TABLE 1 Current Development of HSR

In Operation	In Construction	Planning
Japan	Netherlands	Poland
France	Iran	Portugal
Germany	Turkey	Russia
Italy		Morocco
Spain		India
Korea		Saudi Arabia
Taiwan		Argentina
United Kingdom		Brazil
Belgium		Indonesia
China		Vietnam
United States		

In 1989, the Taiwan government chose to proceed with the construction of the north–south HSR system and subsequently established the Preparation Office for THSR. After the completion of a detailed civil design in 1993, the government decided to privatize the project. This initiative aimed to allow the private sector to participate in the public works project so that it could bring an efficient management style and flexible financing capability to the project. In other words, the government hoped to eliminate the inefficiencies usually encountered in government works projects. In the long run, these inefficiencies were found to be responsible for project delays and the considerable escalation of costs. If the THSR project is successful in achieving the planned objectives, the Taiwan government would likely expand the privatization experience into other public works projects (*3*).

While awaiting the passage of legislation related to privatization laws, the construction of the THSR project was delayed for several years. In 1998, the THSR project was finally awarded to a private company, THSRC, which was to use a BOT scheme. The government and THSRC signed a construction and operation agreement (C&OA). This agreement to use a BOT scheme allowed the concessionaire (THSRC) to have the right to construct and operate THSR for a total concession period of 35 years. After the concession period, THSR will be transferred back to the government.

In 2000, a syndicated loan agreement of NT$312.4 billion (US$10.1 billion) between THSRC and a bank consortium was signed to fund the construction of the project. In the same year, the project's civil construction work commenced and the core system was awarded to the Taiwan Shinkanshan Corporation.

The commercial service for THSR was launched on January 5, 2007. After 2 years of service, THSR is now one of the mainstream transportation systems in Taiwan.

Project Scope

The scope of the THSR project undertaken by THSRC included the following (Figure 1):

- Build a 345-km HSR line from Taipei to Kaohsiung;
- Construct six new stations and retrofit two stations that THSRC shared with TRA;
- Establish five maintenance shops and depots at Sijhih, Lioujia, Wurih, Taibao, and Yanchao; and
- Purchase 30 train sets with maximum design and operating speeds of 315 and 300 km/h, respectively.

THSRC's Primary Goal

The 35-year concession period includes the construction and operation phases of the project. As a result, there was enormous pressure on the concessionaire to complete the HSR system and generate income from the fare box as soon as possible to pay for interest and depreciation. Therefore, the timely completion of the project to commence commercial service was the most important objective for THSRC.

Under the C&OA with the government, THSRC was authorized only to construct and operate THSR. In this case, there was no strong incentive for THSRC to acquire HSR technology through the construction of the THSR project. The only necessary technology transfer for THSRC was the technology for future operations and maintenance. Hence, the privatization of the THSR project led the concessionaire to focus on meeting its objective of achieving timely commercial service.

Implementation Strategy Affected by Privatization

The nature of this privatization project fundamentally affected the implementation strategy. The project's procurement strategy, organization, and management approaches were quite different from those of a public works project:

- On procurement strategy. THSRC used large lump sum design–build or engineering–procurement–construct contracts to delegate the design and construction responsibilities to contractors. Delegating responsibility to contractors streamlined the construction and design processes and reduced the interface responsibility required for THSRC. Consequently, the construction process was turned into one more like the purchase of shelved items.
- On project organization. THSRC turned to the international market to recruit temporary contract professionals.
- On project management. THSRC tried to delegate quality control to independent checking and supervising consultants.

Overall, all of these approaches aimed to accelerate construction and reduce THSRC's role in managing the construction.

South Korean High-Speed Rail Project

Project History

The rapid economic development of South Korea between the 1960s and the 1990s also caused congestion on the expressway between Seoul and Busan. Nearly 70% of the South Korean population and production capability were distributed along that corridor. Three options for improving traffic conditions were considered: a four-lane highway, a conventional double-track railway, and an HSR line. After careful evaluation, the HSR line was recognized to be the most efficient means of improving the situation. The decision to construct an HSR line linking Seoul and Busan was made in May 1989. In

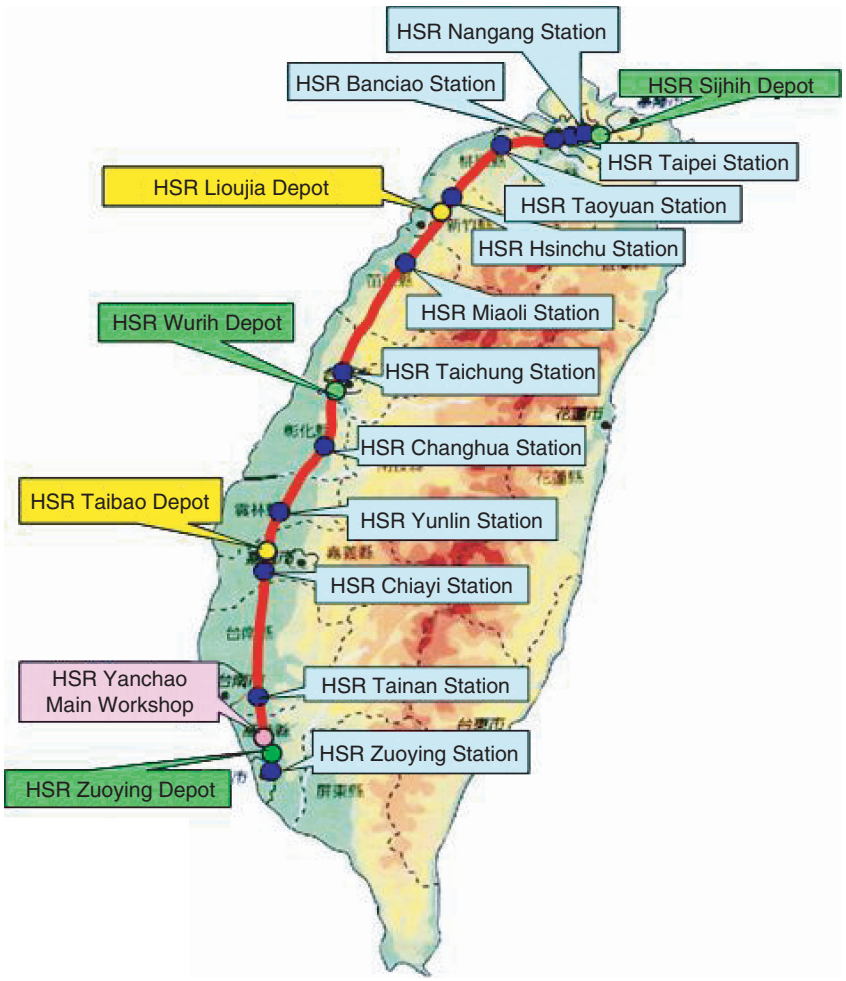

FIGURE 1 THSR network (*2*).

March 1992, the KHSR Construction Authority, which was to be in charge of the construction of KHSR, was established, and construction began on a 57.2-km test section in June of the same year (*4*). KHSR was carried out by the government as a traditional government-sponsored public works project.

During the construction of the KHSR project, numerous political and public interference and interruptions occurred; some of the most significant ones are summarized as follows (*5*):

- Route selection around Kyungju. Strong opposition to the proposed route through the outskirts of Kyungju mounted. Civic groups and environmental and cultural heritage experts, governmental organizations, and lawmakers took part in the debate, which lasted 3 years.
- Indecision over station location. Conflict erupted over whether the Daejeon and Dongdaegu Stations should be built underground or not next to existing railway stations. The construction plans for these two stations reversed repeatedly for nearly a decade.
- Naming a new station. Naming a KHSR station at the border of two cities (Choan and Asan) also became a long and difficult process.
- Tunnel under Mount Cheonsung. A Buddhist nun staged several hunger strikes in 2004 and 2005 to protest the construction of a tunnel under Mount Cheonsung. This incident consequently incurred large cost overruns and further construction delays.

Project Scope

The initial plan (Figure 2) was to construct an HSR line 412 km between Seoul and Busan. Four intermediate stations were located along the route. These four intermediate stations were Cheonan, Daejeon, Daegu, and Kyungju (*4*). The route included 112 km of at-grade sections, 109 km of viaducts, and 191 km of tunnels.

Because of the economic recession in the wake of the severe financial crisis that affected South Korea during the summer of 1997, the initial plan was revised in July 1998. Project implementation was divided into two phases:

Phase 1. Construct a new HSR line between Seoul and Daegu while implementing interim upgrades, and strengthen electrical connections to the existing conventional line between Daegu and Busan.

Phase 2. Construct the Daegu–Busan HSR line via Kyungju, as well as underground stations in Taejon and Daegu

The Phase 1 work was completed in April 2004, and the Phase 2 work was scheduled for completion in 2010.

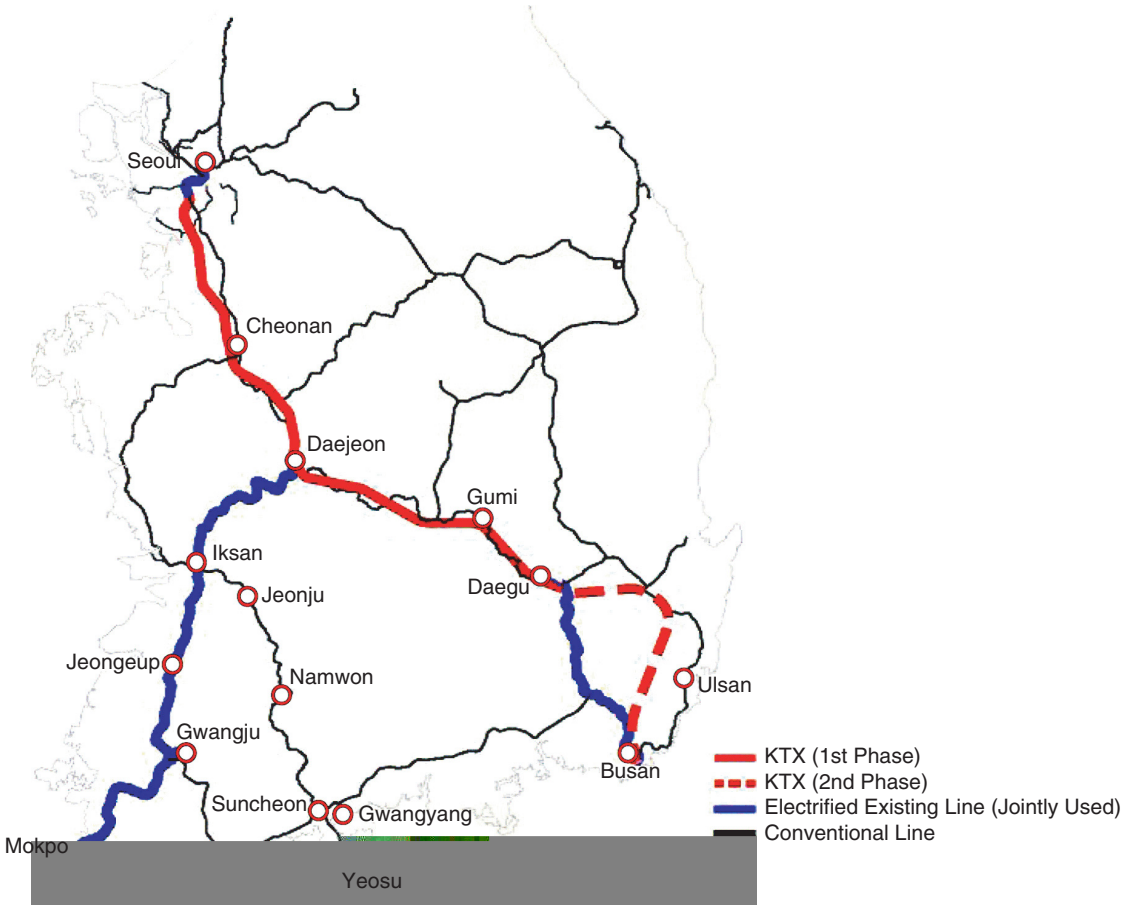

FIGURE 2 KHSR network (*6*).

Owner's (Government's) Primary Goals

The KHSR project had two primary goals (*7*). The first goal was to provide HSR service to the Seoul–Busan corridor. The second goal was to acquire the HSR technology.

Implementation Strategy Reflecting the Owner's Goals

To achieve the technical transfer of the high-speed trains, KHSR selected the French Train à Grande Vitesse technology in June 1994 and awarded the core system contract to a consortium led by Alstom. The scope of the contract included the supply of core systems and technology transfer. Among the 46 high-speed train sets, 12 were to be manufactured in France, whereas the remaining 34 train sets were required to be manufactured locally (*4*).

EVALUATION OF SUCCESSES OF PRIVATE AND PUBLIC HSR PROJECTS

A project is a temporary endeavor that takes place in a specific project environment to create a unique product. For practical reasons, projects cannot be repeated as laboratory tests to explore the effect of one distinct factor. Therefore, any comparison of different projects would be difficult because of differences in their objectives, environments, processes, and end products. However, the similarities that existed between the THSR project and the KHSR project provided a unique opportunity to explore the effects of the major differences in privatized versus government works projects. Both projects

- Were stimulated by a pressing economic need arising from Asia's rapid economic development between the 1960s and 1980s;
- Aimed at solving the freeway congestion that arose from the rapid economic growth;
- Planned to connect the capital city of each country with the largest ports in each country;
- Had similar route distances (345 km for Taiwan and 412 km for South Korea);
- Were aimed at achieving a top operational speed of 300 km/h;
- Were initiated in the same year (1990); and
- Were situated through the corridors with the most densely populated cities: THSR serves approximately 94% of Taiwan's population (22 million), and KHSR serves approximately 71% of South Korea's population (35 million).

It was essential to select the appropriate criteria to be used to evaluate the success of these projects. Over the past decade, many articles in the literature have proposed the criteria to be used to determine project success (*8–12*). On the basis of the existing work, the following

five criteria were chosen for use in the evaluation of the success of these HSR projects in this research:

- Time (the actual completion time versus the initial schedule),
- Cost (the actual cost versus the initial planned budget),
- Quality (system quality versus the initial planned quality),
- The owner's objectives (the satisfaction of the owners), and
- Users' needs (the satisfaction of the users).

The first three criteria (time, cost, and quality) define the success of project management (*8, 12*). Among these three criteria, quality is a rather vague term that requires a specific definition. For HSR systems, quality should be measured in terms of conformity to the functional and technical specifications. An HSR system integrates quite a few subsystems, including infrastructure, rolling stock, signaling and control, station operations, maintenance, management, marketing, and finance. Therefore, the quality of an HSR system depends not only on the quality of the subsystems but also on the integration among those subsystems. An approach for the investigation of quality would be based on the performance of the entire system under the designed operational requirements. Among all indices describing the performance of an HSR system, on-time performance is the most representative index because satisfactory on-time performance requires the excellent performance of all subsystems and their integration.

THSR has been in service for more than 2 years, whereas KHSR has been in service for more than 4 years. Both systems are now operating near their full capacities. As a result, the recent on-time performance criterion of each of these two systems can well represent the quality of their overall systems.

Past research has shown that the success of project management does not ensure the success of the product (*13*). Therefore, two more criteria, in addition to time, cost, and quality, were also considered: meeting the owner's objectives and satisfying users' needs (*13*). Meeting the owner's objectives can be evaluated by judging the completion of the owner's objectives in the initial project plan. In terms of satisfying users' needs, the increased rates in ridership for THSR and KHSR during the steady growth period were chosen as an indicator of users' satisfaction with the two new HSR systems.

When a transportation system is launched, users often require a period of familiarization until they start to adopt the new system; therefore, the buildup of ridership in the new system is often slow and is then followed by a rapid growth period. During the rapid growth period, the benefit and the convenience of the new transportation system gain widespread recognition by its new users. In addition, the new system may be integrated into the existing transportation network. After the growth period, the ridership gradually stabilizes because of market share stabilization with the shares for other competitive transportation systems. This ridership buildup phenomenon can be characterized by a logistic curve, as shown in Figure 3.

Time

During the construction of the THSR project, achieving the target date for commercial service was considered the most important objective of project management. THSRC was granted a 35-year concession period to construct and operate the HSR. In this case, any delay in launching the commercial service not only would result in additional construction costs but also would reduce revenue. The interest cost was initially estimated to be about US$3 million per day for the THSR project. Therefore, privatization of the THSR project compelled the project management team to maintain the timely goal of meeting the commercial service date as the most important target of the project.

THSRC signed the contract with the government to undertake the HSR project in 1998. Project construction began in March 2000, and the original plan was to launch the commercial service in October 2005; however, the commercial service was delayed until January 2007. The 14-month delay was mainly due to the late delivery of the core system.

The KHSR Construction Authority was created in March 1990, and construction began in June of the same year. The project was originally planned to start providing commercial service in December 1998. However, because of the delay stated earlier in this paper, the KHSR project was divided into two phases, with Phase 1 being completed and commencing commercial service in April 2004. Phase 2 is scheduled to be completed in 2010. The delay was about 63 months or more when only Phase 1 is considered.

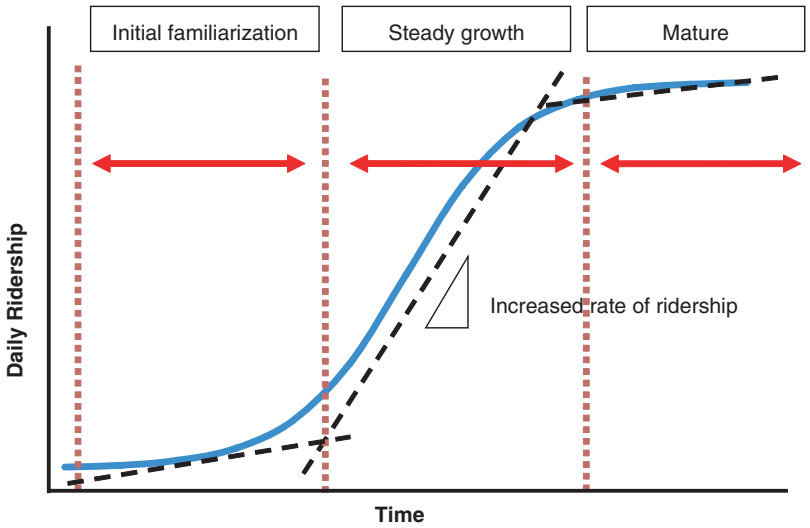

FIGURE 3 Typical trend in ridership increase.

Cost

The project cost overrun requires refinancing of the project by either raising the concessionaire's capital or obtaining additional loans from the financial institutions. Both of these measures could jeopardize the implementation of the project.

The public works projects carried out by the government are budgeted as an annual government expense; project cost overruns can often be allowed in the revision of the budget for the subsequent fiscal year. Public works projects have historically had more flexibility in accommodating project cost overruns. Therefore, cost control for many government-sponsored public works projects is less satisfactory than cost control for privatized projects.

The initial budget for the THSR project was estimated to be approximately NT$444.6 billion (US$14.4 billion) in 2000, and the estimated cost of the completed project was NT$472.7 billion (US$15.24 billion).

The budget for Phase 1 of the KHSR project was estimated to be approximately 5.85 trillion won (US$5.31 billion, in 2000 dollars) at the outset of the project, and the final completion cost was estimated to be approximately NT$12.74 trillion won (US$11.58 billion) upon commencement of system operation (*5*).

Quality

As stated earlier, the on-time performance of an HSR system is the indicator most representative of the quality of integration of all of its subsystems.

The on-time performance of THSR was reported to be nearly 99.4% after 2 years of commercial service (*2*). The on-time performance of KHSR was reported to be 95.5% for the same period of operation (*14*). The difference in on-time performance was partially caused by the fact that a portion of KHSR still shares tracks with the conventional railway.

Meeting the Project Owner's Strategic Organization Needs (Objectives)

The primary objective of the THSR project was to achieve commercial service with the forecast ridership of the system. For the KHSR project, the first objective was also to achieve the forecast ridership, and the second objective was to acquire the technology for an HSR system (*7*).

In this study, the average daily ridership of these two projects was compared with their forecast long-term goals to determine whether they achieved their first objective. For the THSR project, the forecast daily ridership was estimated to be nearly 300,000 passengers per day. For the KHSR project, it was projected to be approximately 150,000 passengers per day.

Figures 4*a* and 4*b* summarize the daily ridership on THSR and KHSR for the period from January 2007 to June 2009. Figure 5 compares the daily ridership on the two systems with their projected forecasts. After 20 months of operation, the THSR project achieved an average daily ridership of almost 84,000 passengers per day, and the KHSR project achieved an average daily ridership of 87,000 passengers per day. The rates of achievement of the long-term daily ridership were about 30% for THSR project and about 62% for the KHSR project. It was also interesting to discover that the average daily ridership of these two systems are similar to each other.

The second objective of the KHSR project was to acquire the technology required for the construction of an HSR system. This can be measured against the transfer of technology from Alstom to the KHSR project and can be evidenced by the high-speed train development capability of the South Korean industry.

Sharma reported that the technology transferred to the KHSR project involved the following (*15*):

- 350,000 documents,
- 23,000 pages in operation and maintenance manuals,
- 1,000 engineers being trained in France, and
- 400 French engineers working in South Korea.

Park (*16*) and Shin (*5*) reported that the South Korean industry has the following capabilities in the manufacture of HSR systems:

- A prototype high-speed train (KTX II) capable of running at a maximum speed of 350 km/h is being tested and will be used in the new HSR line (Seoul–Monkpo), which is under construction.
- A project to develop a high-speed train of the electric multiple-unit type capable of running at a maximum speed of 400 km/h to substitute for the current push–pull type high-speed trains was launched in July 2007 and is targeted to be completed in 2013.

On November 25, 2008, it was reported that KTX II was successfully launched in South Korea, and the KHSR project had achieved the ability to design and manufacture the high-speed train locally in South Korea. In this regard, one can say that the KTX project has achieved the objective of acquiring the HSR technology.

Table 2 summarizes the performance of the two projects in meeting the owners' objectives.

Satisfying Users' Needs

As stated earlier, the increased rate of the ridership during the period of steady growth of a transportation system could be used as an indicator to measure the satisfaction of the users' needs for that system. As shown in Figure 4, for the THSR project there was an increased rate of daily ridership of approximately 2,600 passengers per day per month in the initial familiarization period, and this was followed by a rate of about 5,300 passengers per day per month in the steady growth period.

On the other hand, on KHSR the increase in ridership to its mature phase was very rapid. As indicated in Figure 4, the growth curve for KHSR ridership shows only the steady growth and mature periods; there is no evidence of an initial familiarization period. According to Figure 4, the increase in the rate of ridership on KHSR was approximately 9,400 passengers per day per month in the steady growth period; this was followed by about 1,330 passengers per day per month during the mature period.

COMPARISON AND LESSONS LEARNED

In reviewing the criteria used to determine the success of project management for these two projects, it was evident that the THSR project performed relatively better in terms of the traditional project objectives of time, cost, and quality. However, the government-sponsored public works project of KHSR achieved better product success in terms of meeting the owner's strategic needs (objectives)

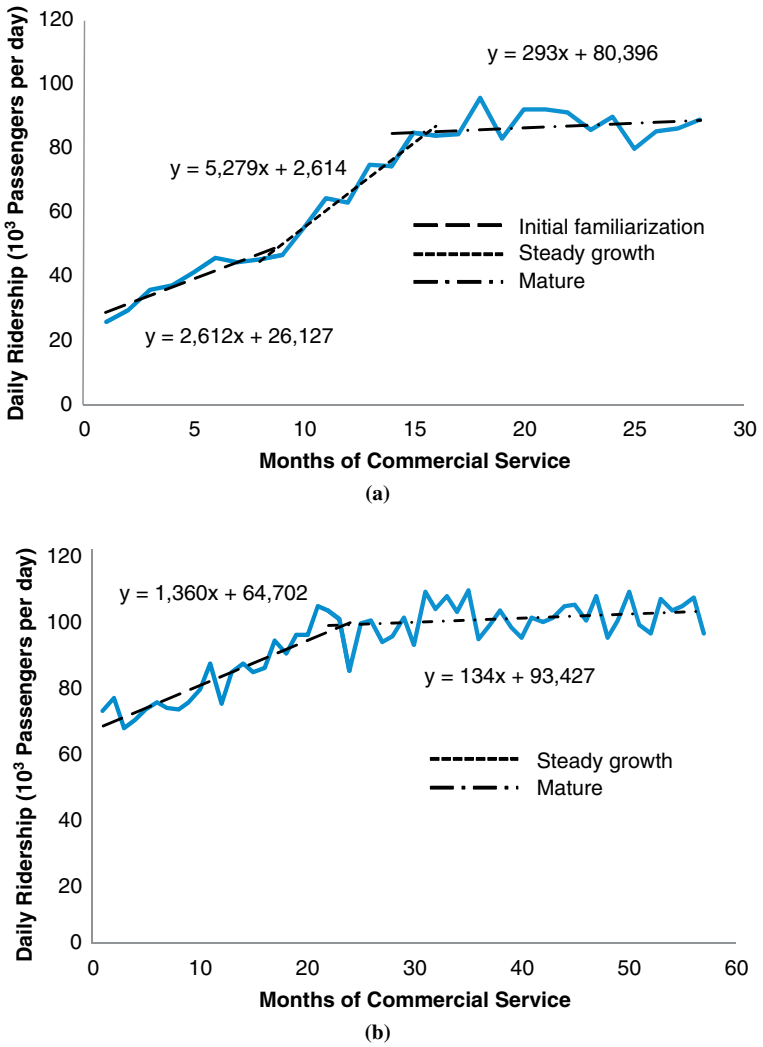

FIGURE 4 Reported ridership of (*a*) THSR and (*b*) KHSR.

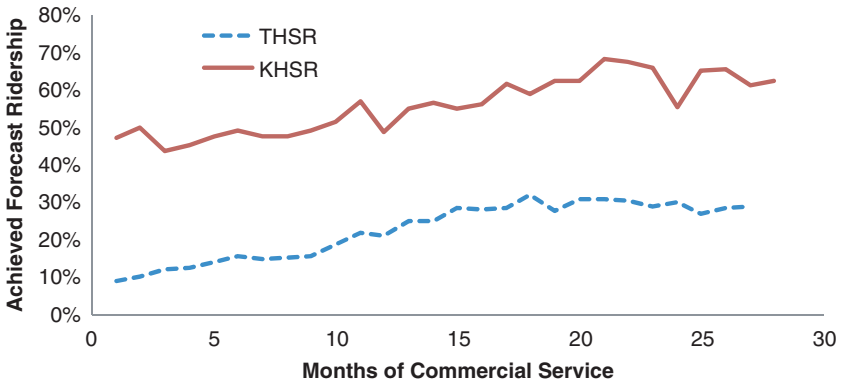

FIGURE 5 Percentages of ridership goal achievement for THSR and KHSR.

TABLE 2 Comparison of THSR and KHSR Owners' Strategic Needs

	Strategic Needs	
HSRs	Objectives	Portion of Objectives Achieved
THSR (Phase 1)	The commercial service	About 28% of forecast ridership
KHSR	Provide additional rail service in Seoul–Busan corridor Acquire technology for high-speed system	About 60% of forecast ridership Achieved successfully (100%)

and satisfying the users' needs. Detailed comparisons and discussions of these two components of the success of these two HSR projects are presented below.

Time

The first time that both Taiwan and South Korea undertook the construction of an HSR system occurred during the projects described here. The technical challenges for both projects were quite similar. However, the completion time for the THSR project was better than that for the KHSR project.

In reviewing the construction history of the KHSR project, it was evident that the construction of the project was heavily affected by the external interference caused by political rivalry and public objections. External interference included the indecision over the alignment of a section of the route for 3 years, the flip-flop decisions over station locations, and the massive public objections to the tunnel under Mount Cheonsung inflamed by a single individual.

In the past, these kinds of influences also caused serious delays to government works projects in Taiwan. At times, this interference was motivated by genuine concerns over public interests. More often, however, they were mediated by hidden personal agendas. One of the reasons that the Taiwan government decided to privatize the THSR project in 1993 was to avoid the effects of these unnecessary influences.

During the construction of THSR, interference similar to that described above occurred every so often. Political pressures were mounted on the governmental agency responsible for the THSR project and on THSRC to realign the route, to relocate the stations, and to suspend construction. Because the THSR project was privatized, the Bureau of High-Speed Rail (the governmental agency responsible for the project) was able to avoid these political pressures because it was not in charge of project implementation. In a few incidents, THSRC was also able to call on the governmental executive power to resist the public objections aimed at interrupting the construction of the project. It is evident that privatization of the THSR project successfully curtailed the external influences that interfered with the project.

In government-sponsored public works projects, the objective of meeting the project's original time schedule was often predisposed to political rivalry and personal interests. The ability to manage and safely guard a project's time schedule was compromised. Accountability for the project's time schedule was also ambiguous. Privatization of the THSR project had ultimately allocated the accountability for achieving project time control within the hands of the concessionaire.

On the basis of the ability of these two projects to control their project times, it can be concluded that a privatized HSR project provides a better environment for management of the time schedule.

Cost

Similar to the inability to control the project schedule, the project management team of a government-sponsored public works project could also face situations over the project cost beyond its control. Consequently, the cost of a government works project was inflated by project delays and changes caused by external interference.

In its eagerness to gain support from legislative institutions and the public, the time and cost overruns of the government-sponsored public works project were further aggravated by the project team's underestimation of the time and costs at the project's outset. Therefore, underestimates were often made with an understanding of the ambiguity of the accountability as part of the nature of government work.

Revision of the budget of a privatized project, however, requires the approval of the investors in the project and the lending financial institutions. These approvals were more difficult to achieve than revision of the government's fiscal budget. Therefore, because of the stringent project control requirements of a privatized project, one can also expect that a privatized HSR project can better manage project costs.

Quality

The on-time performances of both projects were impressive (both were over 95%). Because the two systems were able to operate with satisfactory on-time performance during their operation at the required maximum operating speed (300 km/h) and at their design capacities, it can be concluded that privatization does not have an impact on the quality of HSR projects.

Meeting the Owners' Strategic Goals

For a privatized HSR project such as the THSR project, the primary goal for THSRC was to generate sufficient income from ridership to pay for the investment. However, for the government-sponsored KHSR project, an additional goal was the South Korean government's expectation to develop the HSR industry.

Comparison of the owners' strategic goals for ridership achieved after 2 years of operation showed that the KHSR project achieved its forecast long-term ridership at a higher level than its counterpart, the THSR project (60% and 28%, respectively). However, comparison of the average daily ridership figures for these two HSR systems after 2 years of operation showed that the two were close in the average number of passengers (87,000 and 84,000 passengers per day, respectively). Nonetheless, the expected ridership for THSR was twice as high as that of KHSR (300,000 and 150,000 passengers per day, respectively). The significant difference in ridership expectations

may arise from the need for the owner of the privatized project to impress its investors and lending financial institutions.

With the experience of constructing its first HSR and the transfer of technology from its French partner, South Korea can definitely be proud of becoming a country with HSR and a manufacturer of high-speed train systems. In the beginning, the Taiwan government also had the ambition of developing its rail industry through the implementation of the HSR project, but the privatization of the project provided no incentive for the concessionaire to pursue this initiative.

Satisfying Users' Needs

As stated earlier, the increased rate of ridership during the period of steady growth of a new transportation system can be used as an indicator of the users' satisfaction with the new system. Comparison of the two new HSR systems indicated that the growth in THSR's ridership was more deliberate than that of KHSR. Furthermore, the comparison also showed no evidence of an initial familiarization period for the KHSR project.

The difference between the ridership growth patterns of these two HSRs can also be attributed to the privatization of the THSR project. The initial ridership of the THSR project was much lower than that of the KHSR project (30,000 and 70,000 passengers per day, respectively). Surveys conducted by THSRC at the outset of its operation to investigate the market reaction indicated that the inconvenience of transfer connections was one of the major reasons for the slow pace (*2*). The inconvenience was partially caused by the need for THSR to gain cooperation from other public transportation systems so that passengers could complete their full journeys. However, these public transportation systems were also THSR's competitors, and the introduction of THSR was somewhat viewed as a disturbance to the status quo.

On the other hand, the KHSR system is part of the South Korean Railroad (Korail). The intermodal connections for passengers were already well established by the existing Korail system. There was no resistance to KHSR's introduction into the existing transportation network. As a result, KHSR's commercial service can be viewed as an extended service. On the other hand, a brand new privatized HSR system such as THSR may require a longer period of time to build up its ridership.

CONCLUSION

The privatization of the THSR project presented a unique opportunity to explore the effects of privatization on HSR projects. The study showed that privatization of the THSR project was able to curtail the external influences that might impede the implementation of a project. Moreover, a privatized HSR project has a better chance of achieving the traditional project management success according to the criteria of completion time, cost, and quality.

However, the privatized THSR project indicated that the ridership suffered a slower rate of growth during the initial period of operation because of unfamiliarity and a lack of convenient connecting transportation systems. This type of HSR project will therefore require a prolonged period to be integrated into the existing transportation network.

The government-sponsored KHSR project, however, successfully promoted the national HSR industry and achieved a wider scope of product success than the THSR project. Consequently, a privatized HSR project can be considered a commercial investment for the concessionaire, whereas a government-sponsored HSR project may be seen as a national campaign.

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