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Digestion and Re-innovation: A Lesson Learned from China 's High-Speed Rail Technology-Transfer Agreements

Keywords

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by Joe Massie

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Capitalizing on the eagerness of multinational firms to tap China's enormous market, the Chinese government has promoted a development strategy based on joint ventures between foreign companies and state-owned enterprises. Such partnerships may appear to be a small price to pay for foreign companies, considering the potential financial rewards of entering the Chinese market. However, closer scrutiny reveals that companies agreeing to joint ventures with Chinese enterprises may be falling victim to a myopic focus on short-term profits, overlooking the long-term threat posed by such arrangements. The recent experience of European and Japanese high-speed rail manufacturers highlights the potential pitfalls of entering into joint ventures with Chinese state-owned enterprises.

Keen to modernize its aging transport network, the Chinese government began to consider the construction of a high-speed rail system in the early 1990's. In 2002, the Chinese government unveiled a high-speed rail system produced by Chinese companies, using only state-controlled manufacturers and Chinese intellectual property. However, the government soon recognized that the rail system suffered from poor reliability and that the project would have to be scrapped in favor of a rail system based on foreign know-how. In 2004, work on the original high-speed rail line was abandoned as the Chinese government solicited bids from abroad to help in the construction of hundreds of trains capable of traveling at speeds in excess of 200 mph.

Japanese and European companies had pioneered the construction of high-speed rail. While local demand for their expertise had stagnated, China appeared to be a booming new market. Therefore, an offer by the Chinese government offering access to its rail market in return for the transfer of the companies' technology proved enticing. Bids were soon submitted by the world's principle rail manufacturers: Alstom (France), Siemens (Germany), Bombardier (Canada), and Kawasaki (Japan).

As part of the business arrangement, the foreign companies had to set up production facilities within China and assemble the trains through local joint ventures with Chinese manufacturers. While helping to develop the local supply chain for train components, the companies also had to train Chinese

engineers, sharing their entire know-how and catalogue of technologies. One joint venture partner, Kawasaki, even brought Chinese engineers to its Japanese manufacturing facilities for training.

By insisting on such close cooperation with foreign manufacturers, the Chinese government was implementing a "digestion and re-innovation" program aimed at learning, adopting, and tweaking foreign technology. Although some industry insiders questioned the prudence of the arrangements, companies were spurred by the contracts that were being offered and a fear that they would be left behind by their competitors if they chose not to participate. What the foreign rail manufacturers did not expect was that once their technology had been shared, they would slowly be phased out of the Chinese rail industry, to be replaced by domestic manufacturers, and that former Chinese clients would soon become their global competitors.

In 2007, China first introduced its locally assembled high-speed trains based on foreign technology platforms. Today, the newest Chinese trains contain amenities not found in competitors' trains and, according to their Chinese manufacturers, are more technologically advanced than their foreign counterparts. Based on the knowledge they have gained over the past decade, Chinese rail manufacturers have now turned their attention to markets abroad, participating in high-speed rail projects in Venezuela and Turkey, and bidding on contracts in Brazil, Russia, and even the United States. While the Chinese government is quick to claim that its advances in rail technology were achieved independently through Chinese ingenuity and innovation, some industry insiders have characterized such claims as mere propaganda.

Foreign rail manufacturers have been reluctant to criticize China's actions publicly for fear of being locked out of the Chinese market, but privately many have acknowledged that they have been the victims of forced technology transfers and patent infringement. Prompted by Chinese attempts to file 21 high-speed rail patents, Kawasaki issued a statement condemning China's actions and questioning the provenance of supposed Chinese innovations. The Japanese train producer claims that much of the

technology is actually foreign technology that has been dressed-up and that the Chinese manufacturers have violated the technology-transfer contracts by ignoring clauses stipulating that the technology was only to be used in products intended for the Chinese domestic market. The company has also vowed to take legal action to protect its patents. While publicly dismissing the claims made by Kawasaki, the Chinese rail ministry is currently investigating the industry's exposure to intellectual property suits should Chinese manufacturers begin selling trains abroad.

The experience of foreign rail manufacturers in China should provide a lesson for other industries seeking entry into the Chinese market. Technology-transfer schemes, whereby Chinese state-owned or semi-private enterprises seek to partner with foreign companies in joint ventures in return for access to the Chinese market, may initially appear highly lucrative. However, such deals could possibly result in the creation of Chinese competitors, who have access to all the patented technologies and know-how of their foreign counterparts, but are able to offer their products and services at a far lower cost. Furthermore, foreign firms risk having their technologies stolen, "digested," "re-innovated," and then patented by their Chinese partners. Considering the potential long-term repercussions of such arrangements, foreign enterprises may want to reconsider entering into technology-transfer agreements.