

China's Long Road to Innovation  
by William J. Holstein

11/18/2008

a strategy+business exclusive

# China's Long Road to Innovation

Beijing is mandating an increase in home-grown R&D, but Chinese companies face long odds in meeting international standards of innovation.

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**D**espite the global economic crisis, China's economy is likely to surpass Japan's to become the world's second largest; it could even push past a diminished U.S. economy to become the global leader. Yet a huge question mark hangs over China: Can its companies innovate? The answer to this question will determine whether China will remain, essentially, a low- and midlevel manufacturer of goods that other people design and engineer or it will rise to the top of the technological food chain and compete against the world's leading multinationals.

In one sense, the innovative capacity of enterprises and private companies affiliated with the Chinese government is clear: They are extraordinarily successful at driving down the costs of making products. They have also shown great creativity in taking ideas — even if those ideas are borrowed — that work in one part of China and applying them in the less-developed regions of the country. For instance, Chery Automobile Company imitated or pirated designs from the General Motors Corporation (the issue was settled out of court and neither side will comment). It sold low-cost versions of those vehicles outside China's provincial capitals, in rural areas where GM's joint venture with Shanghai Automotive Industry Corporation (SAIC) had not yet established distribution.

The acid test, however, is whether China can innovate technologically. In the United States, western European countries, Japan, and South Korea, innovation means taking ideas that flow from research, developing them into commercially viable propositions, and introducing them into the market. But unlike those countries, China, in its rush to modernize, has allowed its key technology sectors to be dominated by foreign companies. No Chinese company has emerged to challenge global industry leaders in fields such as software or semiconductors. Some 80 percent of China's high-tech exports come from foreign companies that have located plants on the mainland, estimates Gordon Redding, director of the Euro-Asia and Comparative Research Centre at INSEAD and coauthor of *The Future of Chinese Capitalism: Choices and Chances* (Oxford University Press, 2008).

Even though China invented paper and gunpowder many centuries ago and recently sent astronauts into space, Chinese companies today conduct virtually no research. Therefore, they are not likely to engage in what the West regards as innovation for another 20 years, says Du Debin, a professor at East China Normal University in Shanghai who specializes in the China-based R&D activities of foreign multinationals. He recently spent a year in Silicon Valley studying the fun-

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damentals of American-style innovation. He concluded that the flow of cutting-edge ideas and the infrastructure that allows those ideas to be translated into commercial products does not yet exist in China on the scale necessary to foster innovation.

A shortcut tried by some cash-flush Chinese companies is purchasing innovation capacity by buying parts or all of various Western companies. Lenovo, the large personal computer manufacturer, acquired the PC division of IBM; the SAIC, which has large joint ventures with General Motors and Volkswagen, bought certain assets of Britain's Rover from Ford Motor. But in most cases, when Chinese companies buy foreign entities, they obtain only control of existing technology rather than the talent and internal systems necessary to continue producing cutting-edge ideas. "SAIC got two Rover models as part of the deal, but they are older and dated," says Michael J. Dunne, managing director of China for J.D. Power Commercial Consulting.

The automotive sector is an area of particular focus for the Chinese government, which is anxious to create auto companies that can compete globally. "The holy grail of the auto industry is designing and engineering your own products," says Dunne. "Unless you can do that, it's hard to see how you can be competitive."

Currently, GM and other Western car manufacturers transfer enough engineering and design know-how into their joint ventures with Chinese state-owned manufacturers to advance the quality of the products they sell in China, but not so much that the technology leaks into the hands of Chinese automakers. Microsoft, Intel, and Motorola have adopted much the same strategy. Under pressure from the Chinese government to conduct more R&D in China, they care-

fully segment their research operations so that no Chinese company can obtain enough technology or know-how to compete directly against them. Foreign multinationals also concentrate on R&D activity for the Chinese market rather than for global markets, another way to guard against creating new competitors.

**Reverse Flow**

Some Chinese researchers, engineers, and designers who work for multinationals in China have left to work for domestic enterprises, and many more will over time, says Du. "If scientists leave foreign companies, they bring out knowledge and that's good for China," he notes. He says this flow of talent will eventually create "indigenous" innovation, the goal that the Chinese government is pushing.

Another potentially important flow of know-how is the *hai gui*, or Chinese who are returning from the United States after having worked in technology firms there. *Hai gui* literally means "sea turtles," which is what Chinese jokingly call the returnees, evoking the turtles that return to the beach where they were born to lay eggs. One such returnee is Anthony C. Chen. Chen was among the first wave of Chinese students to go to the United States in the 1980s to study. He received a law degree from Harvard University and is now an intellectual property attorney for Jones Day in Shanghai.

Chen says the returnees, whose exact numbers are not known, are bringing their entrepreneurial know-how back to China and launching start-up firms. They are taking advantage of China's much cheaper technical talent and its readily available venture capital and private equity money. "There is a pretty dynamic flow of talent," says Chen.

## Overcoming Obstacles

A few Chinese companies are taking preliminary steps toward R&D-based innovation. Huawei Technologies, for example, has developed a large patent department and has filed several thousand patent applications. Lenovo, which is controlled by the Chinese Academy of Sciences, a government-sanctioned group for leaders in the scientific community, is funding early-stage research in computer science. But for the most part, Chen says, Chinese firms are not yet willing to invest large sums in R&D. “They are more worried about survival and getting the product out on the market,” he says. “They don’t feel they have the luxury of supporting pure research.” Instead, they buy or license technology and adapt it to the local market. This activity may be profitable in the short term, but it does not contribute to the creation of a strong R&D base.

Ultimately, Du and other Chinese experts question whether Chinese enterprises and companies can ever innovate technologically. One issue is culture. In Western and Japanese companies, researchers are allowed to develop ideas rather than being told which ideas to pick, and they are allowed to fail. These conditions require a delicate balance between a company’s top management and its technical talent. But in Chinese companies, which tend to be very centralized, individual initiative and risk-taking are rarely rewarded. Chen also argues that Communist Party control of the economy is a disincentive for innovation. “The party wants all the good ideas to be its ideas,” he says.

The government is attempting to overcome these barriers to innovation with a 15-year plan for science and technology, launched in early 2006 as the first step toward China’s goal of being a world leader in the field by 2050. It aims to increase the percentage of its gross domestic product devoted to R&D from 1.3 percent today to 2.5 percent by 2020. By comparison, the United States currently spends about 2.5 percent of its GDP on R&D, and Japan spends slightly more than 3 percent. The government is also stepping up its demand on foreign multinationals to conduct more R&D in China and is discouraging low-level forms of investment, such as the manufacturing of technologically unsophisticated products like apparel. Finally, it is revising its tax and export duty system to encourage focus on technologically advanced products.

But Western experience suggests that governments cannot dictate the pace of innovation and that Chinese enterprises and companies will have to take up the

challenge in earnest if China is to take the leap made by Japan and South Korea to become world-class competitors. Unless that happens, China may still become the world’s largest economy, but it will not achieve its dream of being a true economic superpower. +

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