



## Rising Giants: Industrial Clusters Are Changing the Face of Chinese Manufacturing

Published : June 03, 2009 in [Knowledge@Wharton](http://knowledge.wharton.upenn.edu)

Over the past 30 years, most economists have come to believe that advanced economies are less likely to be driven by strong, lone companies than by complex ecosystems, or clusters, centered in a particular industrial sector. The evidence shows that outsized economic growth often requires an outsized pool of talent and specialized capital in a single geographical region. Intuitively, this makes sense -- the public might like the idea of the heroic entrepreneur, but from Wall Street to Madison Avenue to Silicon Valley, the biggest success stories in American business are often less about an individual's or company's triumphs than the strength of interdependent, regional communities within an industry.

Teaching each other, helping each other, pushing each other -- the evidence all suggests that companies tend to profit from proximity, though what is good for business in general may not always maximize the fortunes of a particular company.

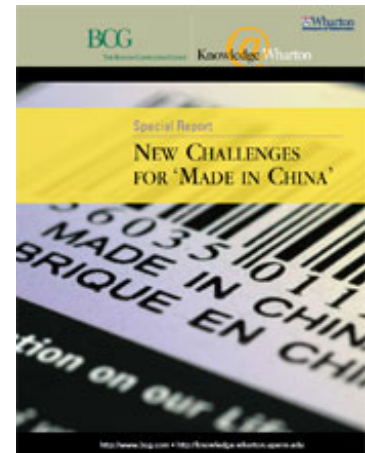
In China, a recent study by the National Science Foundation, titled, "Analyses of Dynamic Factors of Cluster Innovation -- A Case Study of Chengdu Furniture Industrial Cluster," found that the presence of many firms in a single area helped encourage innovation, diffusion of new ideas, flexibility and specialization. In this article, part of special report on manufacturing challenges in China, experts at Wharton and The Boston Consulting Group (BCG) discuss factors driving the growth of clusters in China and the opportunities and risks clusters present.

This look at the manufacturing sector comes at a time when China's factories face deep retrenchment. Exports are plummeting amid the global economic downturn and domestic demand appears unable to take up all of the slack. Moreover, with failing factories driving millions of idled workers back to the farms from the coastal industrial centers, the country's explosive growth rate of the last couple of years is unlikely to return anytime soon and, therefore, the upward pressure on China's labor rates has eased. So, at least for the moment, there is much less discussion about manufacturers shifting their operations to lower-wage countries like Vietnam. Still, the need to hold down costs and improve production quality has only increased given the current market conditions, and that makes questions about where to operate in China -- and the value of clusters -- as relevant as ever. At the same time, companies should be thinking about how to position their manufacturing facilities for an eventual recovery.

The value of clusters is a fairly new idea to Western economists. Although some of the thinking behind them dates back to 1890, the term itself was popularized only in 1990 by Michael Porter in his book *The Competitive Advantage of Nations*. It's an idea that Chinese businesses and policymakers have embraced and capitalized on. One reason for the enthusiasm, perhaps, is that winning through cooperation is a core concept of Chinese culture, which has a tradition of highly valuing mutual social obligations. In fact, the original concept can be traced to the early days of Chinese history: More than 3,000 years ago Confucius advised, "Wishing to be established oneself, he assists others to be established."

### The Tailors of Cixi

Regional specializations have always existed in China as they have everywhere. Tailors from the city of Cixi, for instance, have been renowned for their skills for hundreds of years and controlled clothing



This is a single/personal use copy of Knowledge@Wharton. For multiple copies, custom reprints, e-prints, posters or plaques, please contact PARS International: [reprints@parsintl.com](mailto:reprints@parsintl.com) P. (212) 221-9595 x407.

manufacturing in Beijing from the 1680s to the 1930s. Advanced industrial clusters are a fairly recent phenomenon, however. One factor that held back their development was the Maoist tradition of encouraging local self-sufficiency -- an idea that brought industrial production almost down to the village level.

Beginning in 1958 and continuing on into the 1960s, Mao's Great Leap Forward campaign amounted to a great leap backward. The small-scale, low-technology industry he advocated as the way to develop the country actually reduced industrial production by 30%. One result: Many Chinese industries, such as cement-making, are fragmented, and operate with sub-scale and out of date methods -- a good counter-example to why Chinese authorities in many regions now see clusters as the new way to make an economic leap. "These guys are pretty savvy, and they've made some guesses about where they might have some advantage," says Benjamin Pinney, a principal in BCG's Shanghai office.

In some areas, such as the Zhejiang sub-province of Ningbo, where the old tailoring center of Cixi is located, policymakers looked to their roots to find that special advantage. Ningbo decided, literally, to stick to its knitting. It began by converting factories that had made military uniforms into factories for more fashionable garments, at the same time allowing smaller entrepreneurs to form more specialized companies. Today, the sub-province has more than 2,000 apparel companies, which together produce about 5% of the nation's textile output.

Other examples, unconnected to some past industrial glory, include the many factories in the city of Dongguan on the Pearl River delta, which manufacture nearly a third of the world's magnetic recording heads so integral to computer hard drives, and some 16% of all computer keyboards. Additional notable centers include the Nanhai district's Dali township, which produces some 40% of the nation's aluminum products; Zhejiang province's Zhili township, which specializes in children's clothing; and Datang in Sichuan province, with thousands of manufacturers turning out some six billion pairs of socks each year. All told, more than 1,000 clusters are devoted to exports.

The Zhuhai Yacht Industrial Zone on the south coast, meanwhile, hosts some 20 boat makers and rose up in part with the help of government incentives available to many manufacturing clusters. Such incentives have often proved especially important for the development of new high-tech industries like biotechnology, where the government has played a more direct role in providing advantages to business. "China is very good at developing the infrastructure that really enables a city to attract a cluster," says David Lee, a partner and managing director of BCG's Beijing office. "Clearly, they're good at building roads, ports and bridges, but they're also good at building institutes and training facilities."

The growth of biotechnology clusters in Beijing, Shanghai and Shenzhen/Guangdong, for example, results from several government policies going back to the 1970s. The first major policy change allowed more than 200,000 students to earn post-graduate science degrees abroad. Then in 1986, the government made plans to train hundreds of thousands of postgraduates in biotechnology. Next, they encouraged biotechnology professionals who had been working abroad to return home. Many did, and founded companies, drawing on the managerial and scientific expertise gained in their careers in the U.S. and elsewhere.

In biotechnology and in other clusters, company formation tends to proceed a little differently than in most Western market economies. Essentially, the Chinese authorities argue that entrepreneurship is less a function of spotting a profitable opportunity than it is an ability to form alliances with those who hold key assets.

The entrepreneur's social connections with government officials, for example, are often far more important than in the West. At the same time, working these connections is not simply a matter of gaining approvals by passing some envelopes under the table. Unlike arrangements in other emerging markets, analysts say that local governments in China today often add real value to local clusters by championing industry more generally rather than picking winners and losers among individual companies, as in the past. In Ningbo, for instance, the government began as a shareholder in some local firms, but now more often organizes trade and fashion shows, or coordinates local development.

When this broader approach at coordination with industry works, as it seems to have in textiles and biotechnology, it adds effective state support to the initiative and energy of entrepreneurs. Some

observers even argue that one key reason China is so much further ahead economically than Russia is that Chinese local officials tend to view business more as a source of long-term growth than a short-term revenue opportunity.

On the corporate side, companies like the service they receive in the industrial parks where clusters tend to locate. "A lot of these clusters are anchored around enormous industrial parks, and these industrial parks are typically government entities," Pinney says. For a foreign company, opening a factory in one of these parks can offer advantages, he notes. Such parks generally have an office to coordinate contact with other agencies, such as local environmental inspectors and tax authorities -- key contacts for companies in a country where individual connections count for a lot.

These kinds of strong relationships are important in a semi-directed economy. Get on officials' good sides and taxes can be cut and permits signed quickly. "For other companies maybe it will take three months to get one approval. For us, maybe three days," one well-connected CFO told *CFO Asia* magazine. On the other hand, get on the government's bad side and suddenly, approvals may take a whole lot longer, and getting a clear answer about how local authorities are interpreting a new regulation may be more difficult.

Yet buying into the cluster mentality, even with connections to the right officials, isn't a foolproof strategy. Much of the overbuilding in China today, for example, reportedly results from town fathers championing pet projects driven more by self-aggrandizement than prospects for financial return. That kind of official involvement can also lead to the championing of outmoded industries. Automotive clusters are now favored because officials imagine that will help to develop other sectors, including steel and chemicals, according to [John Zhang](#), a professor of marketing at Wharton. But Zhang argues that the accompanying fuel subsidies that may be good for boosting demand in Shanghai, Chongqing and other automobile centers now may damage the economy in the long run because they siphon money away from other clusters and stunt development of more energy-efficient technologies.

### **A Slow Push West**

The vast majority of China's industrial clusters are located near China's east coast, where infrastructure is much stronger. A 2006 survey of 138 foreign and domestic logistics companies by real estate firm Jones Lang LaSalle, for example, found that 85% of their warehouses were located in just three different regions: the Yangtze River Delta, the Pearl River Delta and Greater Bohai Bay. The only eastern city where logistics companies maintained any presence was in Chengdu, where they have located 5% of their warehouses and other assets.

But a number of multinational companies, including Intel Corp. and Ford Motor Co. have set up plants in less-advanced interior cities, lured by the prospect of cheaper land, labor and tax benefits.

The government launched its "Go West" policies nearly a decade ago, intended to encourage broader geographic distribution of development, but much of the outside investment seems instead to be focusing on pre-existing western clusters. In fact, most of the new investment has concentrated in the western provinces' two largest cities, Chengdu (11 million) and Chongqing (at 31 million, China's largest city), according to the China Supply Chain Council.

Intel, for instance, now operates two plants in Chengdu. For Intel, the move to Chengdu was hardly a sacrifice. Chengdu's Hi-Tech Zone is home to 968 high tech companies, including 387 other Fortune 500 companies. Chengdu also produces more than 20,000 bachelor's, master's and PhD graduates every year, just in electronics. At the same time, the site location cost the company just a fifth of what it had paid in Shanghai, and the city gave the company a steep tax break for moving in, according to the Chengdu Business Guide. The company nevertheless doesn't seem to see either cheaper land or cheaper taxes as the biggest draw in Chengdu. Instead, when it opened its first Chengdu plant in 2003, Intel cited Chengdu's "strategic location, the quality of its educational system and the well-trained workforce in the region" as its reasons for selecting the city as its production base.

Apart from a few highly successful examples, however, the success of the western strategy has bogged down in the face too little transportation infrastructure and too much bureaucracy.

### **Should You Join?**

So if a delegation from a city's economic development office invites you to join a cluster -- even if it is in the right city for your company -- should you accept?

"It's a question I think about a lot," says Pinney. "There is no easy, right answer. It depends on who you are and the capabilities you want to tap into." Xian, for instance, one of the few successful clusters to take root in the western part of China, was once the home of the nation's largest aircraft factory, which used to produce knock-off versions of Soviet fighter aircraft. This gave the city a large population of trained machinists -- a big draw for McDonnell Douglas, Boeing, Airbus and other foreign aerospace companies when they were looking for a home in China. That skilled workforce offered a clear-cut advantage for the aerospace and defense companies.

But in newer clusters, there's often no *there* there, as Gertrude Stein said of Oakland, California. "What may exist is an aspiration for a cluster," says Pinney. "A city might put out a brochure that says it is an excellent location for medical technology companies, semiconductor companies, and some other thing. But when company analysts examine the offer, they find that it's rather wishful thinking," a place in which they have hung out a banner and hope someone will come. And while less-established clusters may offer tax breaks and other incentives to attract companies, there is a potential downside: It's possible the cluster won't take root. "You don't necessarily want to be the last one to join or the first one to join," Lee says.

Yet, even established clusters can offer their own brand dilemma. On the one hand, mature clusters can offer more access to advanced expertise, and more potential supply and distribution partners. On the other hand, clusters can sometimes limit a company's ability to grow. They tend to be expensive operations bases, Wharton and BCG experts note. Labor costs, for example, tend to be higher where a lot of skilled labor is required. Then again, a highly skilled, specialized labor force often brings higher productivity, particularly in certain industries. "Silicon Valley is an extraordinarily expensive place to do business, but everyone goes there because you can get great people. The business logic says go there even though you're going to pay through the nose for people," Pinney says. If you're making pharmaceuticals and need to pass an FDA inspection it's a lot easier to do that with a workforce that already knows something about the business than "a farmer coming in from the hinterland," he adds.

Another advantage to joining a cluster in China -- at least for a company starting out -- is that workers there tend to be more open to moving between companies than is typical elsewhere in the country. In the Nanjing and Yangtze delta area, says Pinney, "the talent moves back and forth between all the foreign and local chemical companies that make their home there." Locating in a cluster can also lead to new opportunities and innovation, particularly for specialized service companies. In Hangzhou, for instance, a fast-growing local company called Han's Laser has had tremendous success in encouraging button-makers to use a special laser machine to engrave tiny brand names on buttons, a simple addition that can raise the value of a button ten-fold. When a company such as Han's "offers extremely high value added, it can propagate very, very quickly," says [Marshall Meyer](#), a professor of management at Wharton whose research focuses on China.

## The Next Big Thing

Certain kinds of clusters seem destined to reinvent themselves in surprising ways, as they have in Ningbo for the last 400 years. At the same time, others may fade. In general, as we will see in the next parts of this report, the national government is trying to push the country's manufacturers into higher-value goods. As the cost of labor rises and the country cedes some of its supremacy as a source of low-cost labor to Vietnam and other lower-cost markets, new sources of comparative advantage will need to be developed.

For clusters, this seems to mean that some sectors, such as toys and simpler textiles, are likely to fade in importance, even as others, such as biotechnology, grow. The locations are also likely to change: Victor Du, a principal in BCG's Shanghai office, says we should still expect to see some clusters develop in interior cities where the cost of living is still much cheaper. Some reports have noted just how much a little infrastructure investment in these areas could help: If China could reduce transportation costs by half in the region, it would enjoy a 5% jump in foreign investment in the cities located well into China's interior, notes one World Bank report.

