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Soon Made in China: High-Tech Products

**Intel Investment Shows
How Nation's Economy
Is Climbing Value Chain**

By **ANDREW BATSON**
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BEIJING -- China is demonstrating a surprising ability to parlay its dominance in low-end manufacturing into a new strength in producing sophisticated high-tech goods.

Already the place where many of the world's computers and mobile phones are put together, it is expected to become home to a multibillion-dollar integrated-circuit plant run by **Intel Corp.**, the world's biggest maker of computer chips.

The speed at which China is moving into more-complex manufacturing is a sign that its transition from a low-wage economy making cheap goods to a high-wage economy producing valuable ones may not be as difficult as once thought.

China's government said last week it had approved Intel's application to build a \$2.5 billion integrated-circuit manufacturing plant in the northeastern port city of Dalian. Intel, of Santa Clara, Calif., is expected to announce details of its plans on Monday in Beijing.


Intel spokesman Chuck Mulloy said, "We have said for many years that we would be interested in putting a fabrication facility in China, but we have nothing more to say about that at this time."

No Longer Just Assembly

The electronics business is one of the main areas in which the transformation of Chinese manufacturing is taking place, and foreign investment is crucial for those changes. This deal also illustrates the force behind that transformation: The critical mass that China has built up in the labor-intensive, but relatively simple, assembly and manufacturing of many products is now allowing it to attract higher-value parts of those businesses.

China assembles much of the world's home electronics, such as DVD players, having attracted manufacturers with its low land and labor costs and its efficient ports and transportation infrastructure. Their investment has made China the place where the parts are put together, but not usually the source of the parts themselves or of the designs -- which are often the most lucrative segments of the business.

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But now an increasing number of key components are being manufactured domestically, as companies see the benefits of putting that production close to the point of final assembly. More and more integrated circuits are being produced here. A decision by Intel to build a chip-fabrication facility in China, its first in a developing country, is likely to accelerate that trend.

China's evolutionary push also reflects worries that low-cost assembly and manufacturing isn't a sustainable business model. Economic growth is pushing wages and living standards ever higher. So China's government and industry aren't assuming that its competitive advantage in low-cost labor will be permanent, and they are working to establish different strengths.

"Yes, China has a lot of labor, but at this moment we still have a skilled-labor shortage, and in coastal areas the labor costs have been rising. In India, labor costs are even lower than in China," said Qian Wang, an economist with J.P. Morgan Chase & Co. "When labor costs rise again in the future, labor-intensive products may not be that advantageous anymore."

China's investment boom of the past couple of years has helped speed the shift. High profits and cheap bank loans have allowed companies to build new factories and install higher-quality equipment, reducing their need to buy from more advanced economies. That has in turn expanded the nation's trade surplus and contributed to frictions with the U.S. and European Union.

Philippines Could Be Cheaper

"China is going to continue to move up the value chain. But the U.S. isn't static," said John Frisbie, president of the U.S.-China Business Council, an advocacy group. "Our economy continues to innovate. Everyone said Japan was going to eat our lunch, but they didn't."

Ed Pausa, a semiconductor-industry specialist at PricewaterhouseCoopers, said that contrary to popular belief, China isn't the cheapest place to run an integrated-circuit operation. The Philippines, for example, could be cheaper. But logistically, he said, China is irresistible.

"If you already have a factory making laptops or cellphones here, you want to have your supply chain as integrated and tight as you can," Mr. Pausa said.

The pattern in electronics is also seen in other industries. Chinese steelmakers have recently begun producing types of high-end processed steel that previously had to be imported. The car business has gone from near-total reliance on imported parts to heavy use of components made and designed at home.

There is still a technical gap. Intel's plant, while advanced by Chinese standards, is expected to be two generations behind the state of the art at the time it opens, probably in a couple of years. It is unlikely to manufacture Intel's signature microprocessors, the calculating brains of a computer. The Chinese government's announcement said the plant's main product will be chipsets, which play a supporting role.

'Growing Stage'

"It's certain that Intel is not putting its most advanced technology in China, where the semiconductor industry is still in an early, but growing, stage," said Mo Dakang, a Chinese semiconductor-industry consultant. U.S. export controls and other restrictions are likely to

continue to restrain international semiconductor companies from using top-level technology in their China facilities, he said.

Intel's decision to go with a lower-level technology was probably based on two main considerations: protecting trade secrets from competitors in China and obtaining U.S. government approval to move the needed technology into the country. It could also help limit the political backlash in the U.S.

In Washington, the concern on Capitol Hill in recent years has chiefly been with Chinese investments in the U.S. Intel's investment would be outbound, and so fundamentally different; so far it has attracted little attention among politicians. But in the current political climate, there is always a risk that U.S. lawmakers may raise alarms as the deal gains wider attention. Of concern would be the potential risk of transferring to China civilian technologies that could be adapted for military use, or that might eventually put U.S. companies at a long-term competitive disadvantage.

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