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IN DEPTH | GLOBALIZATION IN RETREAT

China's Next Target: U.S. Microchip Hegemony

The semiconductor industry, a stalwart of the global economy, is succumbing to fierce nationalistic competition

By Bob Davis Follow *and Eva Dou* Follow
July 27, 2017 11:11 am ET

WUHAN, China—At a muddy construction site the size of 12 baseball stadiums, globalization is turning into nationalism.

Truck after truck delivers steel rods to China's Tsinghua Unigroup Ltd., a state-owned firm that's spending $24 billion to build the country's first advanced memory-chip factories. It's part of the Chinese government's plan to become a major player in the global chip market and the move is setting off alarms in Washington.

When Unigroup tried to buy U.S. semiconductor firms in 2015 and 2016, Washington shot down the bids. It is considering other moves to counter Beijing's push.

China is aiming "to take over more and more segments of the semiconductor market," says White House trade adviser Peter Navarro, who fears Beijing will flood the market with inexpensive products and bankrupt U.S. companies.

Unigroup's CEO Zhao Weiguo says he is only building his own factories due to Washington's refusal to let him invest in the U.S. "Chinese companies have faced discrimination in many areas," of technology, he says. "Abnormal discrimination."

A worker inspects a wafer of chips at a Tsinghua Unigroup factory in Wuhan, China. PHOTO: ADAM DEAN FOR THE WALL STREET JOURNAL

Semiconductors—the computer chips that enabled the digital age and power the international economy—have long been among the most globalized of industries, with design and manufacturing spread across dozens of countries.

Today, the industry is riven by a nationalist battle between China and the U.S., one that reflects broad currents reshaping the path of globalization. Washington accuses Beijing of using government financing and subsidies to try to dominate semiconductors as it did earlier with steel, aluminum, and solar power. China claims U.S. complaints are a poorly disguised attempt to hobble China's development. Big U.S. players like Intel Corp. and Micron Technology Inc. find themselves in a bind—eager to expand in China but wary of losing out to state-sponsored rivals.

For decades, Western companies worked in the developing world to develop advanced technology by harnessing cheap labor to spread iPhones and laptops globally. The new semiconductor battle marks a shift toward nationalism, trade battles and protected markets.

Behind the rivalry are different views of how technology should advance. The U.S. has long bet on markets and private sector-led development. China uses government financing and planning to create domestic champions. The U.S. estimates China will eventually spend $150 billion on the project, a figure equal to about half of global semiconductor sales annually.

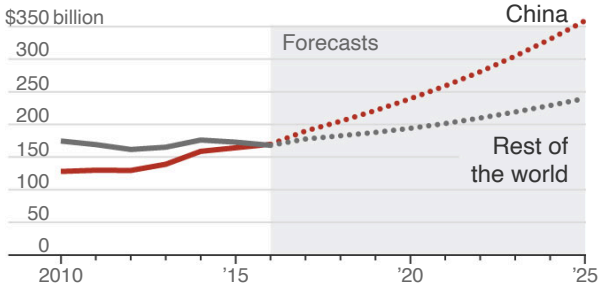
Though Republicans and Democrats are at odds on many economic policy issues, they're unified on this. An interagency working group on semiconductors, started by the Obama administration in 2015, has continued meeting under President Donald Trump. The group is weighing policies to make it more difficult for China to scoop up U.S. technology, according to people involved in the discussions.

One idea is tightening the rules covering U.S. approval of foreign investments to make it tougher for Chinese firms seen as security risks. Other options include trade sanctions, stricter export controls and added federal research spending.

China Decides to Cash In on Chips

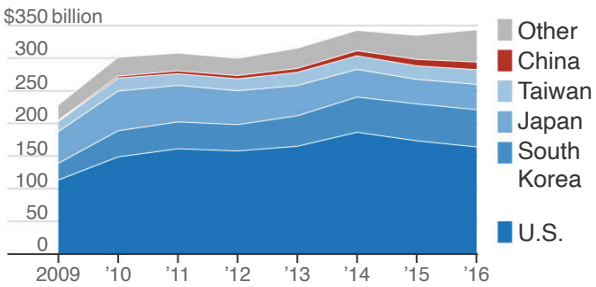
China, where factories and consumers use more semiconductors than the rest of the world combined, is expected to widen its lead...

Semiconductor market



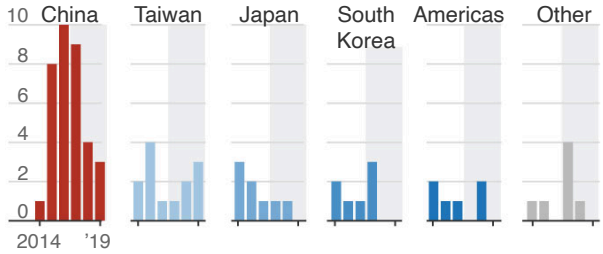
...and is thus key to the success of U.S.-based chip makers, which are already losing global market share.

Semiconductor revenue, by location of headquarters



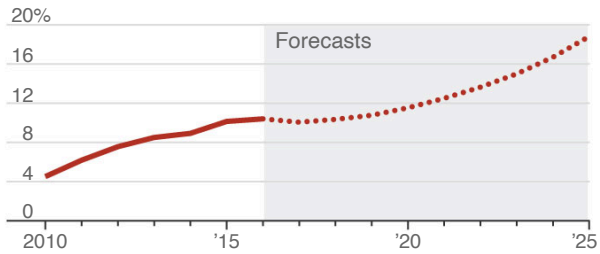
As the Chinese government pushes domestic companies to vastly increase capacity...

New fabs or semiconductor production lines under construction



...foreign manufacturers are worried they will get crowded out.

China's share of its domestic semiconductor market



Sources: International Business Strategies (China market and market share); Sanford C. Bernstein & Co. (revenue); SEMI (fabs)

The general principle, say those involved, is reciprocity: treating Chinese investment in the U.S. the same way Beijing treats U.S. firms. If Beijing discriminates against U.S. firms, the U.S. would limit Chinese investment in the U.S.

"If [the Chinese] become a very big and fully competitive technological competitor, then what does that do to our industry?" said Commerce Secretary Wilbur Ross in an interview. "Does it destroy our semiconductor industry economically?"

The U.S. views China as its biggest semiconductor challenge since Japan in the late 1980s. The U.S. triumphed then through trade sanctions and technological advances. Japanese firms couldn't match

U.S. microprocessor technology, which powered the personal computer revolution, and fell behind South Korea in low-margin memory chips.

China has advantages Japan didn't. It is the world's biggest chip market, consuming 58.5% of the global $354 billion semiconductor sales in 2015 according to PricewaterhouseCoopers LLP. That gives Beijing power to discriminate, if it wants, against overseas suppliers.

China's tech ministry has dismissed such concerns, saying in an interview with The Wall Street Journal that the electronics industry is too globally competitive for any company to survive if it chooses its components based on anything but price and quality.

Beijing's semiconductor program shifted into high gear in 2012, when the value of its chip imports surged past its bill for crude oil for the first time, says Wei Shaojun, a Tsinghua University electronics expert who advises the Chinese government.

Nearly 90% of the $190 billion worth of chips used in China are imported or produced in China by foreign-owned firms, estimates International Business Strategies Inc., a research firm. Many chips are assembled in Chinese factories into mobile phones and computers for export. The top 10 chip vendors in China by revenue are foreign.

"We cannot be reliant on foreign chips," said China's vice premier, Ma Kai this year at a meeting of the National People's Congress, China's legislature. He heads a Communist Party committee that designed the country's plan in 2014. Beijing created a $20 billion national chip financing fund—dubbed the "Big Fund"— and set goals for China to become internationally competitive by 2030, with some companies becoming market leaders.

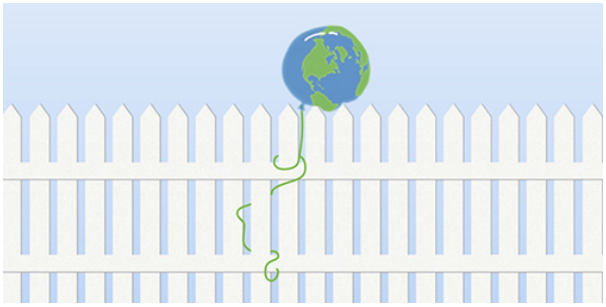
The microchip production line at a Unigroup facility in Wuhan. PHOTO: ADAM DEAN FOR THE WALL STREET JOURNAL

Local governments created at least 30 additional semiconductor funds, with announced financing of more than $100 billion. If all these projects are realized, the global supply of memory chips would outstrip demand by about 25% in 2020, estimates Bernstein Research, pushing prices down and battering profits of semiconductor companies globally.

Chinese policy advisers say many of the provincial investment announcements are bluster and some projects won't materialize. Beijing has been consolidating 600 small Chinese chip makers, many unprofitable, into a handful of larger companies China wants to compete internationally.

Mr. Zhao, the 50-year-old Unigroup chief, was one of the first to win the government's blessings. In 2009, his personal investment company acquired a 49% stake in a commercial subsidiary of Tsinghua University, called Tsinghua Unigroup, and entered the chip sector.

Globalization in Retreat



Whatever Happened to Free Trade

GE, the Ultimate Global Player, Is Turning Local

China's Next Target: U.S. Microchip Hegemony

Trade's Test Case: Your Washing Machine

How China Swallowed the WTO

Strange Bedfellows: Democrats and Trump Blow Up 20-Year Unity on Trade

The marriage of state universities with commercial ventures is an example of China's hybrid capitalism, meant to bring academic findings to market swiftly.

The son of a schoolteacher labeled a "rightist" during the Cultural Revolution, Mr. Zhao says he grew up herding sheep in Xinjiang, China's northwest frontier. He tested into Tsinghua University, one of China's top schools, and studied electrical engineering. From there he worked for years at Unigroup's sister company, also owned by Tsinghua University. He set up an investment company, expanded into coal, energy and real estate before taking his stake in Unigroup. Hurun Report, a research firm in Shanghai, estimated his wealth at $2.6 billion in 2016.

Mr. Zhao cultivated political connections through years of generous donations to the university, including ancient strips of bamboo containing passages from Chinese classics. The university's alumni include Party chief Xi Jinping, who has visited to admire the bamboo collection.

When the Big Fund financed an acquisition blitz, Unigroup was in the lead, bidding in 2015 for memory-chip maker Micron Technology, and then for a 15% stake in data storage firm Western Digital Corp.

In all, Chinese firms made about $34 billion in bids for U.S. semiconductor companies since 2015, estimates Rhodium Group, a market research firm.

Workers are seen on the site of a huge Unigroup construction site in Wuhan. PHOTO: ADAM DEAN FOR THE WALL STREET JOURNAL

Some bids were so overvalued U.S. government officials joked the Chinese were willing to pay an "espionage premium."

After a Chinese plan to buy a Royal Philips NV semiconductor-material unit fell apart, Phillips sold the unit to a U.S. private-equity group for about half the earlier price. Philips declined to comment.

The bids spooked Washington and the industry. In private meetings, Micron, Intel and others warned they faced an "existential threat" from China, say industry and government officials. The companies feared they were trapped in a prisoner's dilemma. Each company was under pressure to sell to China for fear its competitors would sell if it didn't.

"U.S. semiconductor leadership is facing major challenges," said an Intel spokesman. Micron declined to comment.

In July, Germany approved restrictions on foreign technology purchases, aimed at China, and the European Union also is considering barriers.

President Barack Obama raised U.S. concerns about Chinese technology plans with Mr. Xi in a 2016 meeting, according to Obama aides. The U.S. Committee on Foreign Investment in the U.S., an

interagency review group, made clear most proposed acquisitions wouldn't pass muster.

According to Rhodium Group, only about $4.4 billion in Chinese semiconductor acquisitions were completed since 2015. Unigroup's bid for Micron fell apart. South Korea, Taiwan and Japan also blocked Chinese acquisition bids.

Shortly before Mr. Obama left office, a White House semiconductors panel warned the Chinese effort "threatens the competitiveness of U.S. industry" and proposed a boost in basic U.S. research and restrictions on Chinese investment if Beijing's policies harmed U.S. firms. Mr. Trump proposed a 13% decrease in federal funding for basic research to $28.9 billion in fiscal year 2018, but semiconductor lobbyists say they hope to eke out an increase for chip-related research.

At a global semiconductor trade group meeting in Arizona in February, Chinese delegates complained the U.S. unfairly blamed them. They counted the number of times China was listed in the Obama report—55—to underscore their displeasure, say U.S. attendees. Chinese chip executives argue South Korea is a bigger threat to the U.S. chip industry due to its advanced technology.

Unigroup workers in Wuhan. PHOTO: ADAM DEAN FOR THE WALL STREET JOURNAL

Blocked from buying their way into the market, China is recruiting talent from foreign firms, licensing technology, or perhaps stealing it, says Mr. Ernst, the technology analyst. Unigroup and other Chinese executives deny they steal technology.

After Unigroup's plan to acquire Micron fell apart, it hired Charles Kau, the former head of Micron's Taiwan joint-venture, and other experts from the island. It announced it would build its own memory chip facility—the mammoth Wuhan factories—at about the same price it would have paid for Micron.

Unigroup now has a new plan for Micron. It says it no longer wants to buy the firm, recognizing the chances of regulatory approval in the U.S. are nil, but says the two should work together to battle market leader Samsung Electronics Co. The combination of Micron technology and Chinese capital would help both companies take on the South Koreans, says Mr. Zhao, the Unigroup CEO.

With the U.S. government worried about China's military getting a lift from U.S. technology, U.S. semiconductor executives say such a hookup is unlikely. Ernest Maddock, Micron's chief financial officer, told financial analysts in June that the firm is open to joint ventures in China but one that involved the transfer of intellectual property "would be at the difficult end." Samsung declined to comment.

Micron says the Federal Bureau of Investigation has begun investigating whether Micron employees in Taiwan who went to work for other firms, including Unigroup, have taken Micron technology with them.

"We will aggressively protect what Micron team members have spent decades building," wrote Joel Poppen, the company's general counsel, in a blog post. Unigroup's Mr. Kau confirms the investigation and says, "We are clean."

—Yang Jie in Wuhan, China, contributed to this article.

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