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INTERNATIONAL COVER STORY

Why Taiwan Matters

The global economy couldn't function without it. But can it really find peace with China?



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Want to find the hidden center of the global economy? Take a drive along Taiwan's Sun Yat-sen Freeway. This stretch of road is how you reach the companies that connect the vast marketplaces and digital powerhouses of the U.S. with the enormous manufacturing centers of China.



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The Sun Yat-sen is as bland as any U.S. interstate, but it's the highway of globalization. Though it snakes along the whole west coast of Taiwan, the key 70-km stretch starts in Taipei's booming new Neihu district of high-tech office buildings and ends in Hsinchu, home to two of Taiwan's best universities, its top research center, and a world-renowned science park. Along the way, the Sun Yat-sen leads to some of the most important but anonymous tech outfits in the world: Asustek Computer, whose China factories spit out iPods and Mini Macs for Apple ([AAPL](#)); and Quanta

Computer, the No. 1 global maker of notebook PCs and a key supplier to Dell ([DELL](#)) and Hewlett-Packard. You'll also find Taiwan Semiconductor Manufacturing Co. ([TSM](#)), the biggest chip foundry on the planet, an essential partner to U.S. companies such as Qualcomm and Nvidia ([NVDA](#)). Dozens more companies dot the Neihu-Hsinchu corridor. There's AU Optronics ([AUTO](#)), a big supplier of liquid-crystal display panels, and Hon Hai Precision Industry, which makes everything from PC components to Sony's ([SNE](#)) PlayStation 2, and which is a fast-rising rival to Flextronics International ([FLEX](#)), the world's biggest contract manufacturer. Taken together, the revenues of Taiwan's 25 key tech companies should hit \$122 billion this year.

Taiwan's success is also China's. No one knows for sure how much of China's exports in information and communications hardware are made in Taiwanese-owned factories, but the estimates run from 40% to 80%. As many as 1 million Taiwanese live and work on the mainland. "All the manufacturing capacity in China is overlaid with the management and marketing expertise of the Taiwanese, along with all their contacts in the world," observes Russell Craig, of tech consultants Vericors Inc.

CROSS-STRAIT DRAMA

Impressive stuff. Yet for many people around the world, Taiwan evokes only one thing: the standoff between the People's Republic of China, which considers the thriving democracy as just one of its provinces, and Taiwan President Chen Shui-bian, who has made little secret of his dream of one day declaring Taiwan independent. This cross-strait drama is now in a tense new phase, played out with dramatic effect in recent weeks. First Beijing passed an anti-secession law authorizing an attack on Taiwan in case it moves towards independence. Taiwan responded with a massive anti-Beijing rally. Then came the shocker: The late April visit to the mainland by Lien Chan, Chen's chief political opponent and chairman of Taiwan's Kuomintang (KMT). As millions of Taiwanese and Chinese watched on television, Chinese President Hu Jintao shook hands with the opposition leader at a lavish state reception in Beijing. After Lien returned to Taipei on May 3, Hu's government sweetened its PR offensive with more goodies, including a plan to ease restrictions on Chinese travel to Taiwan, lift tariffs on some Taiwanese agricultural

imports -- and send two giant pandas to the Taipei Zoo. To add even more surprise, Taiwanese President Chen, despite some of his supporters' fury at Lien's visit, inserted himself into the dialogue. Chen agreed to send a message to Chinese President Hu through another opposition leader, James Soong of the People First Party, who was scheduled to start a China trip on May 5. Hu seems to be counting on his contacts with the opposition to increase pressure on Chen, forcing him to accept that the island is part of China. But that's a concession Chen's unlikely to make.

Real reconciliation thus seems a long way off. Yet any serious attempt to lower the tension would hold huge promise for the executives who run America's IT industry, which depends on Taiwan for so much of its goods. A shooting war between Taiwan and China would be catastrophic in human terms. And for the Western companies that have built their fortunes around Taiwan, the damage would be a direct hit to the global economy and the Digital Age. "It would be the equivalent of a nuclear bomb going off," says a top executive at a U.S. high-tech giant. Couldn't U.S. industry develop sources of IT supply that don't involve the Taiwanese? "That's like asking, 'What's the second source for Mideast oil?'" says this exec. "You might find it, but it's going to cost you." Insiders estimate that it would take a year and a half to even begin to replace the vast web of design shops and mainland factories the Taiwanese have built. "The IT model is not one built on second-sourcing," says Ken Wirt, a top executive for the handheld business of palmOne Inc.

Not that Taiwan and China aren't also extremely pragmatic. Throughout this turbulent spring Taiwan Inc. hasn't missed a step. For instance, Acer Inc., the PC maker, increased sales by 40% in March; its models are among the top five sellers in the world. Dell and Hewlett-Packard will source \$10 billion and \$21 billion respectively from Taiwan this year, estimates Chicago-based consulting firm THT Research, which tracks contract manufacturing. Apple is boosting its order book from Taiwan companies by 28% from a year ago, to \$5 billion. Quanta on Apr. 8 announced a partnership with the Massachusetts Institute of Technology to cooperate on research into the next generation of computing. Despite a cyclical downturn that has hurt profits, TSMC has embarked on a \$2.6 billion ramp-up to produce more custom-designed chips than ever. Compared with a more specialized chipmaker such as Intel, "we have maybe 100 times the number of product lines," says TSMC chairman and CEO, Morris Chang. "It takes a very special expertise."

China may threaten Taiwan as No. 1 IT supplier. But for now it's Taiwanese engineers who provide ever-more-ingenuous solutions to manufacturing and design conundrums. "In Taiwan, people say the U.S. understanding of outsourcing is backward," says Victor Zue, co-director of the Computer Science & Artificial Intelligence Laboratory at MIT. "It feels more like the Taiwanese are outsourcing marketing and branding to the rest of the world."

The island's high-tech industry has had to improve its skills sharply to get where it is today. Barely a decade ago, Taiwan made components or assembled machines designed elsewhere, and was only a marginal player in more lucrative segments of the electronics industry. Today its companies are increasingly proficient at original design, and dominate manufacturing in key categories. In LCD screens the Taiwanese have passed the Japanese and rival the Koreans. Taiwan is tops in routers, notebook computers, and cable modems. The PC industry "has really consolidated around Taiwan," says John A. Antone, Hong Kong-based head of the Asia Pacific region for Intel Corp. ([INTC](#)), which has 400 engineers at work on the island. "That's just where the best engineering is done."

How does Taiwan do it? Lower pay helps. "You look at the engineering costs in the U.S. and compare them to Taiwan's, and we are talking about one third of the cost," says Kai Hsiao, director of global procurement for greater China at HP. Visit Taiwan-owned factories on the mainland, and you will find that assembly line wages average \$120 a month.

But Taiwan's advantage goes way beyond cheap labor. The island combines an entrepreneurial culture with effective government involvement. The Hsinchu-based Industrial Technology Research Institute is a collection of labs that works closely with local companies. It has 4,300 engineers striving to match the best that the West, Japan, and Korea can offer in fields such as microelectronics and optoelectronics. The government-backed Institute has alliances with scientists from MIT, the University of California at Berkeley, and Carnegie Mellon University in the U.S. Companies such as TSMC and cross-town rival United Microelectronics Corp. ([UMC](#)) have their origins in ITRI technology.

The result is one of the deepest reserves of high-tech talent in the world. It starts with figures such as Chang, who

was present at the creation of Taiwanese tech. Walk into Fab 12, TSMC's multibillion-dollar facility in Hsinchu, and off to your left you'll see a giant portrait of the chairman sitting, pipe in hand, in an armchair. Surrounding him are scenes from his life -- as a child in Hong Kong, as a student at Harvard, and as TSMC chief at the company's debut on the New York Stock Exchange. But the silver-haired Chang, 73, isn't done yet. He's still working hard to beat rivals UMC in Taiwan and Semiconductor Manufacturing International Corp. (SMIC) in Shanghai. He's also pushing Taiwan's politicians to build up the island's schooling. "I wish we had a world-class university," he says.

Chang and other tech leaders blend Western values -- Chang took liberal-arts classes at Harvard before studying mechanical engineering at MIT -- with Asian culture. One minute Jonney Shih, Asustek's 52-year-old founder, will be discussing Six Sigma best practices and the next minute he'll be evoking the Changshan snake described in Sun Tzu's *Art of War*. When attacked at one end, the serpent counterattacks with the other. "We need that kind of fast reaction," says Shih.

The quick reflexes of Taiwanese like Shih make all the difference. Unlike Korea, where Samsung Electronics Co. and LG Electronics Inc. dominate, Taiwan is composed of smaller and nimbler outfits. When Taiwanese companies get too large, they tend to spin off businesses and refocus. Hence, in 2001 computer maker Acer Inc. begat consumer electronics company BenQ and LCD panel maker AU Optronics. The Hsinchu-based chip design houses spun off from UMC include MediaTek and Novatek, a designer of chips for LCDs.

Some of Taiwan's most important tech companies have also grown by acquiring technology from elsewhere. Chi Mei Optoelectronics Corp. (CMO) licensed LCD technology from Fujitsu Ltd. ([FIJSY](#)) and hired top engineers to come up with the rest of the expertise it needed to become a leading LCD producer.

All these businesses excel at serving corporate customers. Eighteen months ago, after Intel had made a big bet on Centrino, the wireless Internet system for notebook PCs, the American company sought out a partner that could quickly get Centrino computers to the market. So Intel teamed up with engineers at Acer. Within three months, says Acer CEO J.T. Wang, they not only came up with a high-end Centrino notebook sold under the Acer brand but also mid-tier and even entry-level PCs using Intel's new technology.

Taiwanese companies will do just about anything to please customers. When Quanta was first working on what promised to be a hot new design for a top client, it had to work in total secrecy. Quanta executives guaranteed the U.S. customer that all work would be done in the middle of the night. They even had the assembly line draped in concealing black. Other Taiwanese companies combine discretion with an ability to handle even the smallest orders. HP's Hsiao says he places orders for as few as 10 PCs of a specialized configuration. The Taiwanese can process and ship such an order in 48 hours. "They can change direction overnight," says Hsiao.

This do-whatever-it-takes ethos has led Taiwan's businesses to move to the mainland at astonishing speed. "In 1999 we had about 300 employees" in China, says Alexander Lee, head of operations for Asustek in Suzhou, China. "Now we have more than 45,000." Issues of loyalty don't enter the equation. Acer CEO Wang recently asked his own Taiwanese suppliers if, as good citizens, they'd keep some production in Taiwan. "Their answer was: 'No way,'" he says.

The Taiwanese also play a vital role for rivals on the mainland. Liu Chuanzhi, chairman of Beijing computer company Lenovo Group Ltd. ([LNVNG](#)), which just completed its purchase of IBM's PC division, says Lenovo sources components from Taiwanese companies. According to THT Research, Lenovo even buys notebooks from Quanta, Compal, and MiTAC. Liu says that's not the case.

Most important of all, the Taiwanese are the real developers of China's semiconductor industry. Chinese companies such as SMIC ([SMI](#)) depend on squads of Taiwanese executives for knowhow. TSMC is still far ahead but it is starting to focus on China, too. The Taipei government has allowed TSMC to invest \$900 million for its own plant in China.

In effect, Taiwan is hoping to control design and innovation while giving over much of its manufacturing to China. When U.S. companies come to Taiwan today, they say, "This is what we want. Do you have it?" says Billy Ho, president of MiTAC, which makes smart phones, PDAs, and servers.

Increasingly, the Taiwanese do. Two years ago, MiTAC decided to upgrade the PDAs it sells under its own brand name as well as under several different names in Europe. In discussions with the sales team, Ho recalled how, when he lived near Birmingham, England, he would get baffled by the layout of the city streets. A PDA with GPS, the satellite-controlled global positioning system often found in cars, was the answer. Today, MiTAC is No. 3 globally in PDAs, behind only Dell and HP.

The Taiwanese know they're good at such innovations. But they also know they are being squeezed on price even while they are under relentless pressure to be more creative. "Margins have come screaming out of the PC business because products have become very commoditized," says Michael Marks, CEO of Flextronics Corp. Net margins at Asustek have fallen to 6.4%, from 19% in 2001. The company's 2004 net profit of \$484 million was 7% lower than what it was in 2001, although sales nearly tripled in the same period to \$8 billion. Both Quanta and Compal have suffered from falling profit margins too, despite fast-rising sales.

Some analysts also wonder how long the Taiwanese will have the edge in chips. "I don't think Taiwan is in the driver's seat anymore," says James C. Mulvenon, co-author of a 2004 Rand Corporation study on Taiwan's and China's chip industries, which concludes that European and Japanese chipmakers will provide China with technology the Taiwanese refuse to share.

One way out is to find new markets. "We have to get into the next wave of products," says Ray Chen, president of Compal. "It can be TVs, cell phones, home digital media centers. We don't know yet." To do that better, Compal plans to double its R&D team. Quanta's beefing up too. In its \$20 million partnership with MIT, Quanta is looking at using artificial intelligence to link digital devices that have different operating systems. Quanta boss Barry Lam also identifies autos as a promising area. As control and display systems in cars go digital, the Taiwanese can apply their expertise in making complex components for small spaces.

The other way to stay ahead for Taiwan is to create its own brands and maintain solid margins by delivering better performance and design. A leader in the branding effort is BenQ, which has its own brand of thin-screen TVs and MP3 players. Since its launch in 2001, BenQ has stressed in-house design to make its branded products stand out. Manfred Wang, who runs the BenQ design center, leads a team of 70 designers who have, among other things, come up with a PC monitor whose base can be folded up against it, taking up much less space in shipping. "Our designers are aware of the manufacturing process and that's a big advantage," says Wang, who learned his skills in Germany and once worked at Porsche.

At the heart of Taiwan's effort to reinvent itself is the government research institute, ITRI. It's into everything from new wireless networks to nanotubes that provide backlighting for displays. It's also trying to mix the hard sciences with something softer. Enter Room 131 of Block 53 on the main campus, and you'll find the Creativity Lab. The place looks more like an advertising agency than a high-tech center, with its stuffed animals and a comfy couch for a staff that includes artists, psychologists, and an anthropologist, in addition to engineers. The idea is that getting techies together with liberal arts types will help designers think more broadly, says Wen-Jean Hsueh, a PhD in mechanical engineering from California Institute of Technology who is the lab's head. "We know we have strong manufacturing and engineering," she says. "But we have to look beyond this."

Even this fresh effort has to build on Taiwan's engineering corps, which can't expand enough to meet all of Taiwan's needs. With so many companies expanding research and development, "we have to fight very hard to get experienced guys," says Hsiao-ping Lin, head of Faraday Technology, which specializes in chip design services. He hopes to hire Indian engineers, but adds, "in the long run, we will set up an R&D center in mainland China."

That shift to China is understandably of great concern to Taiwan's political and business leaders. But it may be inevitable. "The market here is so much more important than Taiwan's," says Lawrence Ho, the Taiwan-born owner of online music startup 8LaNetwork Inc., which has its headquarters in Beijing's trendy Jianwai Soho district. Ho also appreciates how hard his mainland employees are willing to work -- as many as 90 hours a week.

Taiwan clearly has lots to worry about, but it's also renowned for its resilience. Intel's John Antone compares Taiwan to long-distance runners who are being challenged but who are still in the lead. "As long as they're committed to run very aggressively," he says, "I don't see anyone catching them." Competitors be warned: Taiwan will do everything it can to stay in the race.

By Bruce Einhorn, with Matt Kovac in Taipei, Pete Engardio in New York, Dexter Roberts in Beijing, Frederik Balfour in Shanghai, and Cliff Edwards in San Mateo, Calif.

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