



Chip Geopolitics: If China Invades, Make Taiwan 'Unwantable' by Destroying TSMC, Military Paper Suggests

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staff

January 6, 2022

US military planners are taking notice of a suggestion by two military scholars calling for the destruction of semiconductor foundry company Taiwan Semiconductor Manufacturing Co. (TSMC), whose fabs produce advanced microprocessors used in HPC and AI, in the event China invades the island nation



A news story in today's edition of *Data Center Times* cites the Nikkei Asia news service and a paper in the U.S. Army War College's scholarly journal, *Parameters*, discussing the possibility of Taiwan adopting "a scorched earth policy" and wipe out its own semiconductor foundries in the wake of any Chinese invasion as a deterrent, U.S. military academics have suggested."

"The authors argue that in the face of China's growing military power and sophistication, threats or demonstrations from US military are unlikely to work, and any actual conflict on the island may actually be won by the People's Republic of China," the *Data Center Times* article reported. "Instead, the paper, *Broken Nest: Deterring China from Invading Taiwan*, suggests a 'broken nest' approach wherein Taiwan destroys its own semiconductor industry – including global chip powerhouse TSMC – upon the news of any invasion from China to make it a less attractive target and scupper China's own technology ambitions."

The speculation underscores the geopolitical stakes involved in high-end data center server chips that power supercomputers and artificial intelligence. TSMC, whose customers include HPC-AI powerhouse chip designers NVIDIA and AMD, is of the utmost economic value to Taiwan and to the global economy. It's noteworthy that in the face of threats from China, TSMC last year began construction of a fab in Arizona.

"The United States and Taiwan should lay plans for a targeted scorched-earth strategy that would render Taiwan not just unattractive if ever seized by force, but positively costly to maintain," according to the paper. "This could be done most effectively by threatening to

destroy facilities belonging to the Taiwan Semiconductor Manufacturing Company, the most important chipmaker in the world and China's most important supplier."

The story in Nikkei Asia stated that the *Parameters* article was the most-downloaded paper published by the U.S. Army War College in 2021 – even though the paper wasn't published until mid-November. If TSMC were destroyed in the event of an invasion by China, "Samsung, based in U.S. ally South Korea, would be the only alternative for cutting-edge designs," stated the article. "If TSMC went offline, 'China's high-tech industries would be immobilized at precisely the same time the nation was embroiled in a massive war effort,' the authors note. 'Even when the formal war ended, the economic costs would persist for years,' the paper suggests, adding that such a scenario could hurt the legitimacy of the Chinese Communist Party."

The paper's authors, Dr. Jared M. McKinney (a chair at the eSchool of Graduate Professional Military Education, Air University, and reviews editor of the Journal of Indo-Pacific Affairs) and Dr. Peter Harris (assoc. professor at Colorado State University and Indo-Pacific Perspectives editor of the Journal of Indo-Pacific Affairs) also suggest that to make the threat credible, Taiwan could adopt an approach harkening back to "the Doomsday Machine" in the Cold War film "Dr. Strangelove": "An automatic mechanism might be designed, which would be triggered once an invasion was confirmed," McKinney and Harris wrote.

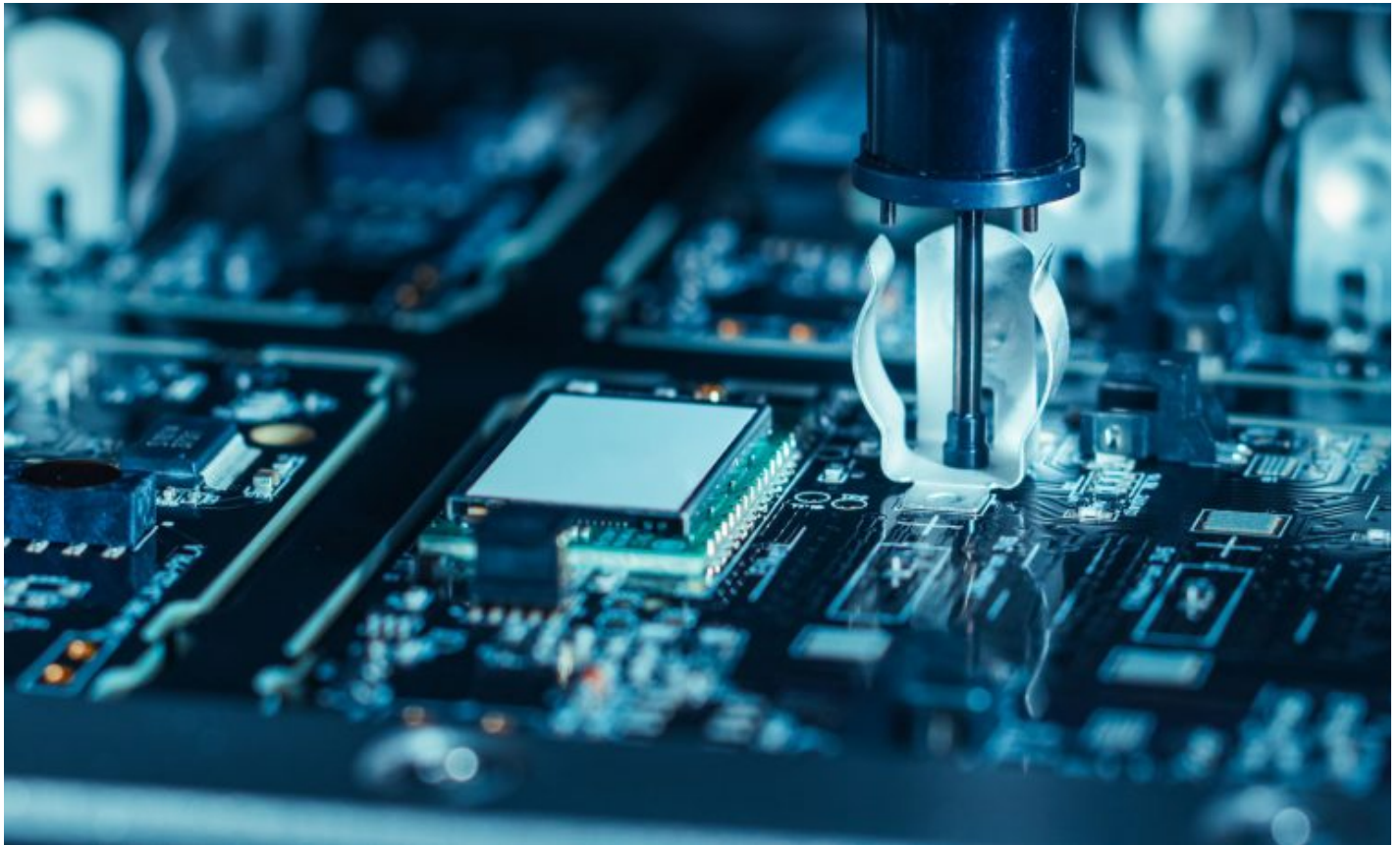
The McKinney-Harris strategy arises amid increasing doubts that a conventional military strategy, such as deployment U.S. Navy ships near Taiwan, would prevent China from invading the island country. "The People's Liberation Army's goal for a successful invasion is 14 hours, a Chinese analyst with connections in the PLA Navy told the authors, while the (Peoples Liberation Army) projects the U.S. and Japan to need 24 hours to respond," stated the Nikkei Asia article. "If this scenario is close to being accurate, China's government might well be inclined to attempt a *fait accompli* as soon as it is confident in its relative capabilities," McKinney and Harris write.

"If the U.S. and Taiwan wish to deter China from invading," Harris said, "then they should look for means of doing so that do not rely on the threat of U.S. military reprisals. Relying exclusively on military threats is becoming less credible and thus more dangerous."



Chips geopolitics and EU's new semiconductors sovereignty agenda

DISCLAIMER: All opinions in this column reflect the views of the author(s), not of EURACTIV Media network.



Microchips are among the most sophisticated technologies in the world. [Shutterstock]

The technological is alarmingly becoming too geopolitical, especially in the case of the current global semiconductor shortage, writes Raluca Csernatonu.

Raluca Csernatonu is an expert on European security and defence, focusing on emerging and disruptive security defence technologies at Carnegie Europe in Brussels.

Also known as microchips, semiconductors are the backbone of today's interconnected world. From older, lower-end used by the automotive industry to high-end ones needed for cutting-edge products such as PCs and smartphones, semiconductors are the 'brains' in all electronic devices.

The ongoing global shortage is of major concern. Why did this happen?

The crisis is linked to a combination of different events and factors. The main culprit was the snowballing effect of the COVID-19 pandemic, which closed down chip production facilities but also triggered a high demand for personal electronic devices by millions of people working from home.

Another factor was the US-China tech trade war, with Washington placing trade restrictions on China's biggest manufacturer (Semiconductor Manufacturing International Corporation – SMIC).

This geopolitical tussle put pressure on non-Chinese manufacturers, already operating at full capacity.

Finally, Taiwan, the biggest player in the semiconductor manufacturing industry, went through its most severe drought in more than a century – a great amount of ultra-pure water is needed in the chip production process. Therefore, bottlenecks were added to the already dire situation.

Today, the US (Intel) competes in many parts of the advanced production processes, like chip design and fabrication, but the highest concentration of cutting-edge chips fabrication and assembly is in Asia, mostly in Taiwan (Taiwan Semiconductor Manufacturing Co – TSMC), then South Korea (Samsung Electronics), with Europe only a minor player.

Owing to manufacturing lags, intensified in the last two years by the pandemic, the chips shortage has prompted states to pursue their autonomy in this strategic sector and to shore up production.

The ongoing global chip shortage thus exposed the geopolitical risks of tech dependencies and in concentrating fabrication in only a handful of countries.

Access to high-end microchips is not only essential to industry, but also for national and international security.

The US has been discussing massive investments and incentives under the bipartisan American Chips Act to support home-grown manufacturing, research and development, and supply chain security.

Maintaining an edge in semiconductors innovation and supporting the resilience of supply chains have become strategic priorities for Washington.

This highlights the fact that semiconductors, as 'foundational technologies', are considered key for both economic performances in the digital age and for military power.

Likewise, the EU aims to strengthen the resilience of supply chains and boost European stakes to reach the top tier chipmakers, aiming at acquiring 20% of the global market by 2030.

In her latest annual State of the Union speech, European Commission President Ursula von der Leyen announced an initiative to enhance the EU's tech sovereignty, the European Chips Act.

It intends to send the political signal that the EU wants to enter the global chips race and expand research and fabric capacity at home.

To this end, the European Commission has also recently kick-started the European Alliance for Processors Semiconductors, bringing together EU member states, businesses, research, and technology organizations.

According to European Commissioner for Internal Market Thierry Breton, with the 'European Chips Act, our sovereignty is within reach'.

Or is it? The EU's ambitions for chip sovereignty might be indeed misplaced, particularly when it comes to the production of leading-edge chips that take a lot of time and money to develop.

Political rhetoric abounds around this goal.

To gain control over production and an upward foothold in supply chains is very difficult. The EU is coming late to the party.

The semiconductors sector is highly concentrated, specialized, innovation-driven, extremely capital-intensive, and importantly, it is controlled by consolidated players in Asia and the US.

Other major impediments for the EU are its own Single Market rules on competition and a history of keeping subsidies to a minimum.

Yet, the European technological sovereignty framing might be useful to convince member states about the merits of a 'more-EU' in coordinating tech innovation and industrial efforts.

Also, going-it-alone in pursuit of strategic autonomy is not always the most feasible approach. Partnerships with third states and commercial players are equally important, if not more so.

This explains Commissioner Breton's recent visits to the US, Japan, and South Korea in an effort to onshore production and attract high-end fabrication to Europe.

To garner interest from chip manufacturers, the bloc can leverage its considerable research ecosystem, scientific and industrial capabilities in key tech sectors, and a skilled workforce.

Two Europe-based success stories are worth flagging. Belgium's Interuniversity Microelectronics Center – IMEC, an international research and development organization, is a leader in semiconductors research.

And the Dutch multinational company ASML is an innovation leader in the semiconductors industry, manufacturing complex machines essential to the production of microchips.

Strategic tech alliances are equally important. Semiconductors and the commitment to rebalance the global supply chain were also on the Pittsburgh EU-US Trade and Technology Council agenda in September 2021.

The Council seems to be the best forum to discuss joint strategies and to find common ground on boosting resiliency and security in supply. Beyond commitments, it remains to be seen how this will work out in practice, as in trying to avoid a global semiconductor 'subsidy race' with the US, and other players such as South Korea and China.

While the EU's plans for chips sovereignty are taking shape, the bloc should focus efforts on fostering an innovation-friendly ecosystem in Europe, matched by substantial European funding to support home-grown tech initiatives when it comes to chip design and manufacturing.

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BROOKINGS

Order from Chaos

Ensuring a stronger US-Taiwan tech supply chain partnership

Jason Hsu Tuesday, April 12, 2022

Editor's Note:

This piece is part of the Taiwan-U.S. Quarterly Analysis series, which features in-depth analysis of important issues in Taiwan and the U.S.-Taiwan relationship by leading experts, with the goal of providing a range of perspectives on developments relating to Taiwan.

In the wake of Russia's invasion of Ukraine, the world has become even more ideologically polarized. As the war and Russian atrocities continue, the United States and its allies are targeting Moscow by imposing a series of sanctions on finance, technology, and trade. While there are concerns that such sanctions could strain global supply chains, it is imperative that actions be taken to uphold democracy and the international rules-based order.

Taiwanese semiconductor manufacturers, including Taiwan Semiconductor Manufacturing Company (TSMC), have also cooperated with U.S. sanctions and bans. Although Russia accounts for an insignificant volume for the import and export of semiconductors, the possible long-term adverse effects should still command our attention. Two are noteworthy — first that China becomes a proxy partner for Russian imports and exports. China's stance towards the sanctions on Russia has so far been ambiguous, and it is unclear whether Beijing will form closer economic ties with Moscow. Second is the possibility of economic retaliation from Moscow on Taiwanese companies operating in Russia after Taiwan was included in a list of "unfriendly" nations by Russia.

One thing is certain — given its centrality in global supply chains, the semiconductor industry will never be fully insulated from great power competition. Given the geopolitical tension between the United States and China, how should Taiwan work with the U.S. to stay resilient and avoid being trapped in the tangle of two superpowers? How can Taiwan

integrate its supply chains with the U.S. and at the same time maintain its own inherent strength? Policy decisions in the U.S. and Taiwan in the coming years will play a critical role in determining if both sides are able to rise to the challenge, including by developing a pipeline of engineering talent, ensuring adequate resources to support technological advances, and incentivizing mutually beneficial collaboration to support deepening integration of value chains in the U.S. and Taiwan.

Meeting demand for chips and talent

At present, all eyes are on TSMC's efforts in opening a new 5-nanometer chip factory in Arizona, as the White House warns of escalating vulnerabilities from a shortage of chips that have disrupted production in U.S. automotive and electronics industries. To meet future demand for semiconductor chips, the U.S. Congress is pushing for favorable legislation and policies to re-shore the chipmaking industry back to U.S. soil by injecting large amounts of funding — an estimate of \$50 billion in federal funding wrapped in the Creating Helpful Incentives to Produce Semiconductors (CHIPS) for America Act. However, it is unclear whether such a push will be successful. The opportunities for success lie in vertical consolidation and horizontal integration.

Taiwan's chipmaking ecosystem is at top of the world because of long-standing support from the Taiwan government's leadership, the cluster effect, outright engineering ingenuity, advanced technological development, close attention to micro-details, and considerable investments in research and development (R&D). Two important factors must be considered for the U.S.-Taiwan tech collaboration to be successful. One is talent pipeline cultivation and retention. In the 1970s, Taiwan's government successfully recruited talented managers and engineers with Ph.D. degrees such as Morris Chang (TSMC), Minn Wu (Macronix), and Nicky Lu (Etron) to return to Taiwan to jumpstart the semiconductor industry. Since then, the world has seen a boom in semiconductors and applications that spans from Silicon Valley to Asia.

However, the industry foresees a great global shortage of engineering talent from upstream to downstream. How do we ensure that the talent pipeline continues to produce the necessary number of engineers and managers? Although top American universities

continue to attract the world's best talent to study in the United States, too few choose a career path in the semiconductor industry. Taiwan faces the same issue. Not only has there been a decline of students pursuing advanced degrees overseas, but there has also been a significant drop in science, technology, engineering, and mathematics (STEM) education overall.

This gap in the talent pipeline must be taken seriously. Federal funding must be allocated in creating training programs and scholarships to attract more students to study in this field. Exchange programs and on-the-job training and research projects must be established between the United States and Taiwan. To tackle this issue, the Taiwan government launched the Taiwan Semiconductor Research Institute (TSRI) in January 2019. The TSRI should collaborate with the American Semiconductor Academy (ASA) Initiative, a collaborative national education network of faculty at universities and colleges across the U.S. who are engaged in semiconductor research and education, to provide in-depth R&D and cross-training programs.

While the U.S. government is putting a great deal of resources in expanding semiconductor fabrication capacity, there are other elements in the semiconductor ecosystem, and comprehensive integration must be applied to build up long-term sustainability for U.S.-Taiwan collaboration. Taiwan, Japan, South Korea, and China account for nearly four-fifths of global fabrication capacity. More than 90% of sub-10 nanometer cutting-edge chips are made in Taiwan. Almost the entire packaging sector is in China and Taiwan. In addition to TSMC, the world's leading chipmaker, there are companies such as MediaTEK, ASE Group, Etron, and Macronix that contribute to the overall success of this ecosystem. Semiconductor competition is a long game. The integration should not only be in semiconductor fabrication, but also in integrated circuit (IC) design, advanced packaging and testing, and other related upstream and downstream industries.

The much-anticipated CHIPS Act boasts a considerable amount of federal funding, with most of the funding to be used in building chip plants. However, more robust policies, such as tax credits, immigration programs, STEM education subsidies, and investment incentives, should be established.

Supply chains and geopolitics

As global geopolitics becomes more polarized, nations are divided not only by their pursued interests but also the values they represent. Taiwan's role in global supply chains will only become more and more important. As the United States continues to ratchet up efforts to build back the chip industry and secure semiconductors, there are big questions looming for U.S.-China-Taiwan relations. How will U.S. efforts to improve its semiconductor industry affect Taiwan and cross-Strait relations? How can the U.S. and its allies protect themselves from China creating new vulnerabilities in the semiconductor industry?

Taiwan's semiconductor industry should engage with and contribute to U.S. solutions to enhance regional security and ensure economic competitiveness. Such integration should create a mutually inclusive partnership rather than involve a dominating takeover. It is in the United States' interest to continue supporting Taiwan in its efforts for self-defense and economic resiliency. This could be achieved by extending U.S. industrial policy that supports "champion" industries and sectors with tax policy, subsidies, and increased R&D spending. It would be wise to rethink the antitrust approach in this sector so that semiconductor companies can achieve the scale necessary to support R&D and competitiveness. A comprehensive plan must be implemented to ensure the access to rare earth minerals needed for the manufacturing of semiconductors, particularly as China continues to dominate the world's supply. Moreover, now is the optimal time for the United States to accelerate bilateral trade agreement talks with Taiwan.

Such collaboration would emphasize resilience, robustness, and effectiveness in technology intellectual property protection, enhanced manufacturing capability, investing in growing and upgrading the workforce, better coordination of global supply chain management, cross-sector investment, and overall integration. Better and deeper economic integration with the United States and an emphasis on supporting Taiwan's own self-defense capability are key.

A stronger U.S.-Taiwan tech supply chain partnership would benefit both the United States and Taiwan as well as allies with shared democratic values. The success of such a partnership relies on trust, accountability, and continuity of policy clarity. While significant funding, favorable legislation, and strong political will are necessary, talent pipeline training and retention, R&D collaborations, and comprehensive industry integration are also vital for that success. Technology should be the means to regional stability and economic sustainability, not an end to it.

Order from Chaos

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Tensions with Beijing throw spotlight on Taiwan's unique role in global tech

By [Eric Cheung](#), [CNN Business](#)

Updated 4:57 AM ET, Thu April 7, 2022

Residents of Taipei on edge about China after Russia invades Ukraine 02:52

Taipei, Taiwan (CNN Business) – Taiwan plays a crucial role in making sure the world gets its cutting-edge technology devices, from laptops to advanced weapons, on time. That's because the self-governed democratic island of 24 million people is a [global leader](#) in the supply of semiconductor chips.

But as tensions escalate between [Taipei and Beijing](#), the fate of that industry has become a global concern. Experts have warned that any disruption to Taiwan's chip supply could paralyze production of key equipment, impacting almost everyone in the world.

The island has been facing growing military aggression from China in recent months. In response, Taiwan has stepped up its own [military training](#), and committed a record amount of defense spending this year.

The advanced chips Taiwan makes are an indispensable part of everything from smartphones to washing machines.

The chaos in global automaking triggered by a pandemic-related shortage of chips over the past year gives a sense of just how bad it could get.

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"With the auto shortage, now you have to wait for six months for European made cars," he added. "If Taiwan stopped supplying chips for other products, then probably you have to wait for over 12 months for a new mobile phone, or even longer for a laptop."

Taiwan's 'sacred mountain'

One Taiwanese company in particular — Taiwan Semiconductor Manufacturing Company (TSMC) — is the world's largest contract manufacturer of chips and plays a critical role in powering products designed by tech companies like Apple, Qualcomm and Nvidia.

With a market cap of nearly \$500 billion, TSMC is one of Asia's most valuable companies, and accounts for 90% of the world's super-advanced chips, [Reuters](#) said in a recent report citing industry estimates.

The firm — widely dubbed in Taiwan as its "sacred mountain" — is so important to the island that its employees can apply to be exempted from [military reservist training](#) — even if they are called upon, the defense ministry [has said](#).

The company did not respond to a request for comment by CNN Business.

Super-advanced semiconductor chips — like the ones produced by TSMC — are difficult to make because of the high cost of development and the level of knowledge required, meaning much of the production is concentrated in just a handful of suppliers.



Employees work at the entrance of the Taiwan Semiconductor Manufacturing Co. (TSMC) Museum of Innovation in Hsinchu. Photographer: I-Hwa Cheng/Bloomberg via Getty Images

The global semiconductor industry has already been under pressure because of a growing supply shortage, with many technology companies reporting delays in securing chips for their production activities. This makes Taiwan even more important, especially as the United States and China engage in a bitter rivalry over developing advanced technologies of the future, such as artificial intelligence and 5G.

If Taiwan were to fall to the Communist authorities in Beijing, Western nations could potentially lose access to the island's valuable semiconductor chips.

Growing concerns

Russia's invasion of Ukraine has heightened concerns about the risk that China could increase its military force against Taiwan. The Communist leadership in Beijing has long claimed the island as part of its territory, despite having never ruled over it.

In recent months, China has stepped up its military pressure on Taiwan, including sending a record number of warplanes near it last October. Chinese President Xi Jinping has refused to rule out the use of force to achieve what he called "national reunification."

But as comparisons are being drawn between Kyiv and Taipei, the Taiwanese government has repeatedly emphasized the strategic role of its semiconductor industry.

"Taiwan and Ukraine are fundamentally different in geopolitics, geography and the importance to international supply chains," President Tsai Ing-wen said as she condemned Russia's invasion of Ukraine last month.

Last month, Taiwan announced it had begun imposing economic sanctions against Russia. Authorities said major Taiwanese chipmakers, which account for more than half of the world's output of semiconductor chips, have all pledged to comply with the move.

the international community — will calculate their response to the threat of, or the invasion against Taiwan.

China's Taiwan Affairs Office did not respond to a request for comment.

Challenges ahead

While Taiwan's role as a leading semiconductor hub may be indispensable to the world right now, experts believe there are challenges for the island to keep up its advantage.

The global supply shortage of chips has already prompted many countries to take steps to break their dependency on Taiwan.

Last week, the US Senate passed a [\\$52 billion](#) plan to invest in the research, design and manufacturing of semiconductor chips in the United States.

China's largest chip maker Semiconductor Manufacturing International Corp (SMIC) has pledged to invest [\\$5 billion](#) in extra capacity this year.

"Right now, China, US and the European Union are all pursuing the so-called next generation semiconductor technologies," Lee said.

"We understand the challenges are coming, and we need to keep our leadership in semiconductors through research and development, and most importantly, cultivating qualified talents that support Taiwan's success," he added.

In response to the challenges, Taiwan recently committed [\\$300 million](#) to chip-focused graduate programs to train the next generation of semiconductor engineers. Last month, it also passed new [legislation](#) that requires those working in key tech roles to seek permission from authorities before visiting mainland China.

As discussions about the future of Taiwan grow, Lee believes the best way to keep the island safe is via powering a combination of military and economic strength.

"That strength comes not only from military strength, but also economic strength."

— *Will Ripley and Wayne Chang contributed reporting from Taipei, Taiwan.*



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MANUFACTURING

The Changing Geopolitics Of Manufacturing And Its Supply Chains

Trond Arne UndheimContributor *I explore humans, technologies, and what's next.*[Follow](#)

Apr 13, 2022, 09:10am EDT

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For twenty years, everyone, expert and novice, has been in agreement about manufacturing. A necessary evil. Takes time. Costly. Involves low-cost labor and huge factories that operate offshore. Major economies will never again lead manufacturing because globalization has arrived. What's wrong with this picture?

The experts were wrong. Everything is changing back and forth. Globalization is challenged by the joint onslaught of a pandemic, geopolitics and technology.

On Thursday, February 24, 2022, Russia invaded Ukraine, major production hubs for energy and wheat respectively, and as an immediate result, Europe's energy supply is under threat. Chinese manufacturing powerhouses, such as the megacities of Shenzhen and Shanghai, have been under COVID-19 lockdown (see [Lockdowns in China Block Truck Shipments and Close Factories](#)). If China continues its Zero-COVID policy, this could happen many more times in the coming years. For these and other reasons, reshoring, even major reshoring that will be costly and take time to implement, is back on the table.

In fact, on April 7, 2022, Tesla opened a [gigafactory in Texas](#) with 10 million square feet of factory floor proving that mass production is again happening on American soil. On April 12, Tulip opened its [digital factory experience center](#) in Somerville, Massachusetts, enabling everyone to touch and feel how frontline operations in many industries will transform over the next decade, raising the possibility that factory production will be led by *shopfloor knowledge workers*. Giving workers full access to analytics and unobtrusive technology empowering their

productivity, will likely also boost teamwork, and increase their loyalty.



Workers set up for the grand opening party at the new Tesla Giga Texas manufacturing facility on ... [+] AFP
VIA GETTY IMAGES

Questions abound. Could this have been predicted? What will happen now? Are we entering a regionalized global economic reality? What would it take for the pendulum to swing back? Or is all this just small ripples in water?

Manufacturing is many things. Producing advanced electronics is not the same as making shoes. Nonetheless, whenever something is produced, infrastructure of some kind is involved. Hard infrastructure, such as factory networks requiring sunk cost investments in high technology takes too long to develop. Soft infrastructure like supplier relationships may look easy to reproduce, but these can be tricky to evolve as they form organically. For example, try competing with the fashion production chain in Italy's Emilia-Romagna region (the subject of the 1984

book [The Second Industrial Divide](#), which argued we should abolish standardized mass production for a system of flexible specialization.)

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Let's see how flexible we have become. COVID-19's first few years were a mixed bag. Surprisingly, everything didn't break down; some flexibility had been built-in. However, the escalating and "lingering" second-order COVID effects are another matter. Any additional disruption on top might topple the ant hill when everything is worn thin. Consider the evidence of rising inflation ([Recession Risk Is Rising, Economists Say](#)), mounting building costs, shortages of advanced electronics components ([How Can Companies Combat the Electronic Components Shortage?](#)), and more.

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The Comeback of the Regions

Regionally dense supplier networks have always been a good idea. Collaboration is better face-to-face, or geographically proximate because skills tend to develop in clusters. Whatever the top skill in a region is becoming the priority for young talent. Consequently, this creates a positive feedback loop, and it is also more practical. Whether it is Northern Italy, the auto industry in the US upper midwest (see [Automation Alley](#)), [New England's high tech manufacturing hub](#), or Shenzhen's hardware production networks, Shanghai's automotive sector, or emerging Chengdu in southwestern China, which now deserves to be known for far more than "producing" Pandas, manufacturing tends to concentrate

geographically. Disruptions are not the only reasons they are back in the big leagues.



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Reshoring can be argued logically (see [Reshoring now](#)) based on total cost of ownership. The reshoring movement also has an obvious nationalist rationale. Nation-states compete for attention and resources, but within their own borders, they redistribute (somewhat) fairly. Manufacturing is a source of great pride, so globalization has always been limited in scope and theory. Globalization, on the contrary, has no democratic infrastructure. Fairness is therefore up for grabs.

In practice, marketplace realities were temporarily allowed to change the rules of the game. Nevertheless, it is a hard sell to push “America first” when labor is 50% cheaper elsewhere. On the contrary, the game can become even again if the US is only 25% more

expensive. technology can make up the gap, or the US is still 50% more expensive. Still, national security and speed-to-market might make up 25% and new technology makes up another 25%. It is that simple. How could policymakers not see that twenty years ago? It is almost unfathomable. Except labor is sometimes 10x cheaper elsewhere (see [labor cost per country](#) or [ILO data](#)). How do you make that up?

The geopolitics of manufacturing has always been there. Since what we make is what we are, manufacturers are at the heart of what it means to be “German,” “American,” “Japanese,” or “Taiwanese.” It has always been about more than economic progress. What’s different in 2022 is that the levers have changed. With investments in research and development, factory infrastructure, reskilling, new technology, and an increasing willingness to use public procurement for strategic intent, nations can still overhaul their manufacturing systems. The problem is, that takes time and money. With that comes risk, and if you play it wrong, you could lose industry leadership and billions of taxpayer dollars, and the reputational risk could alone make a bet go sour.

Recently, the US is mulling creating domestic chip fabs. We are talking about a multibillion-dollar investment over a decade to reshore and reduce the dependency on China (see [White House efforts on the CHIPS act](#) and the Semiconductor Industry Association (SIA)'s [lobbying efforts](#)). Bigger bets yet, would result from the merging of the Senate's [Innovation Act](#) with the House's [Competes Act](#) which remains to be negotiated between them and sent to the President for signature. Is it worth it, and will it even happen? Given the last decades budgetary discussions, it's hard to conceive. Yet, strategically, it makes perfect sense, and it always did. But it requires long-term thinking. Far longer than presidential or congressional periods, it requires the kind of timelines on which China and Russia operate.

How long have these foreign rulers been in office? Xi Jinping has served since 2012 and plans another period at election time this year. Putin has served 16 years and aims to stay President in perpetuity (see [Vladimir Putin passes law that may keep him in office until 2036](#)). That's longevity for you. With that, you can plan manufacturing leadership (and at times many other

things far worse, unfortunately). However, where in the annals of democratic leadership is it written in stone that in order to be democratic, all your leaders must be so mediocre that we kick them out every 4 or 8 years and they cannot serve more than one or two terms? I know, it is in various constitutions but were these rules written for another time? The challenges of today demand longevity. We must weigh the insurance policy of kicking out a lousy leader against the risks of having a series of bad ones that don't get anything "big" in motion.

Energy use is never a given. Powering manufacturing is the most energy-intensive activity humans have ever invented. Germany's government is worried about their dependence on foreign fossil fuels; they are not concerned with their citizens being cold in the winter. After the Fukushima disaster in 2011, Japan briefly mandated large buildings and businesses to reduce electricity usage by 15%, which in practice meant office temperature was so high they were sweating in their suits as air-conditioning was kept to a minimum. True, if Germany were to mandate a 17C indoor temperature, Bavarians might need to wear a sweater

at breakfast in November, but the real challenge is the manufacturing sector. Scores of manufacturing firms would have to shut down production, simple as that.

The last issue on the scene is sustainability. Geopolitically, fossil fuels' current level of energy use is hard to defend. I believe the IPPC has stated as much (see [Sixth Assessment Report](#).) What does that mean for manufacturing? It has to become more energy-efficient and increase productivity—a tall order to enter the future factory. Nothing much will change without this mythical construct, and manufacturing will still be happening offshore wherever it is cheapest. That's just the economic reality. As it turns out, now technology allows us to work some magic for production. Good technology, monitored by great manufacturing operators, can make a big contribution. The contrary is also true. Bad technology run by unskilled workers can mean disaster. Those two extremes are equally possible in the same factory or same region as in the same country. Even if you build a greenfield, legacy organizational patterns might reduce

the ability to achieve such miracles as much as technology does.

What to do about the geopolitics of manufacturing? Adjust. Adapt. Align. Regional networks were never out of fashion, they just disappeared from the grand national narratives. But as nation-states dropped the eye on the ball, regions started collaborating amongst themselves. Some global organizations, notably the World Economic Forum (WEF), are taking notice. WEF's Global Network of Advanced Manufacturing Hubs has quietly operated through the pandemic (see a [2021 Annual Report](#)), and started sharing best practices and collaborating more amongst themselves, without national coordination. It is never the main focus of that sprawling organization; they are still an indicator of the increased dependence on regional innovation.

Are we in a period of massive re-alignment of manufacturing economics? Most definitely. The world went too far towards Lean, just-in-time (JIT) and unified supply chains. As a result, we were chasing an efficiency optimum that doesn't exist. Or, rather, one which would depend on a level of trust across

the globe that is simply not there. Could we achieve that trust? Yes, but not in the next few decades.

Will It All Change?

Will it all change overnight? Will we have a complete de-industrialization of the US, the UK, and Europe? Most definitely not. But between ongoing and coming pandemics, increased geopolitical risk from resource scarcity, and the pitfalls and opportunities from emerging technology, manufacturing will have to change from what we have known over the past few decades. If cool heads prevail, that change will be for the better. Manufacturing will, as it seems, again become the core of the innovation discussion. If not, we are looking at several decades of production far below projections, with suboptimal supply chain duplication and enormous investment costs from regional infrastructure build-up. Some of that will now happen regardless, but there's still scope to fiddle with the optimum at the margins. Just watch out because globalization is not over either.

The contract manufacturers (CMs) of the future will have at their disposal a fully virtualized value stream from

design to shipping of product, which might make even production and supply chains stretched across the globe an efficient, even somewhat sustainable proposition. Also, one should readily imagine that in the event of another geopolitical reprieve, or global threat, frozen relationships will unfreeze as fast as the polar ice caps.

Disclaimer: I have financial interests in Tulip and I co-chair World Economic Forum (WEF)'s New England chapter of the Global Network of Advanced Manufacturing Hubs, both of which are mentioned above.

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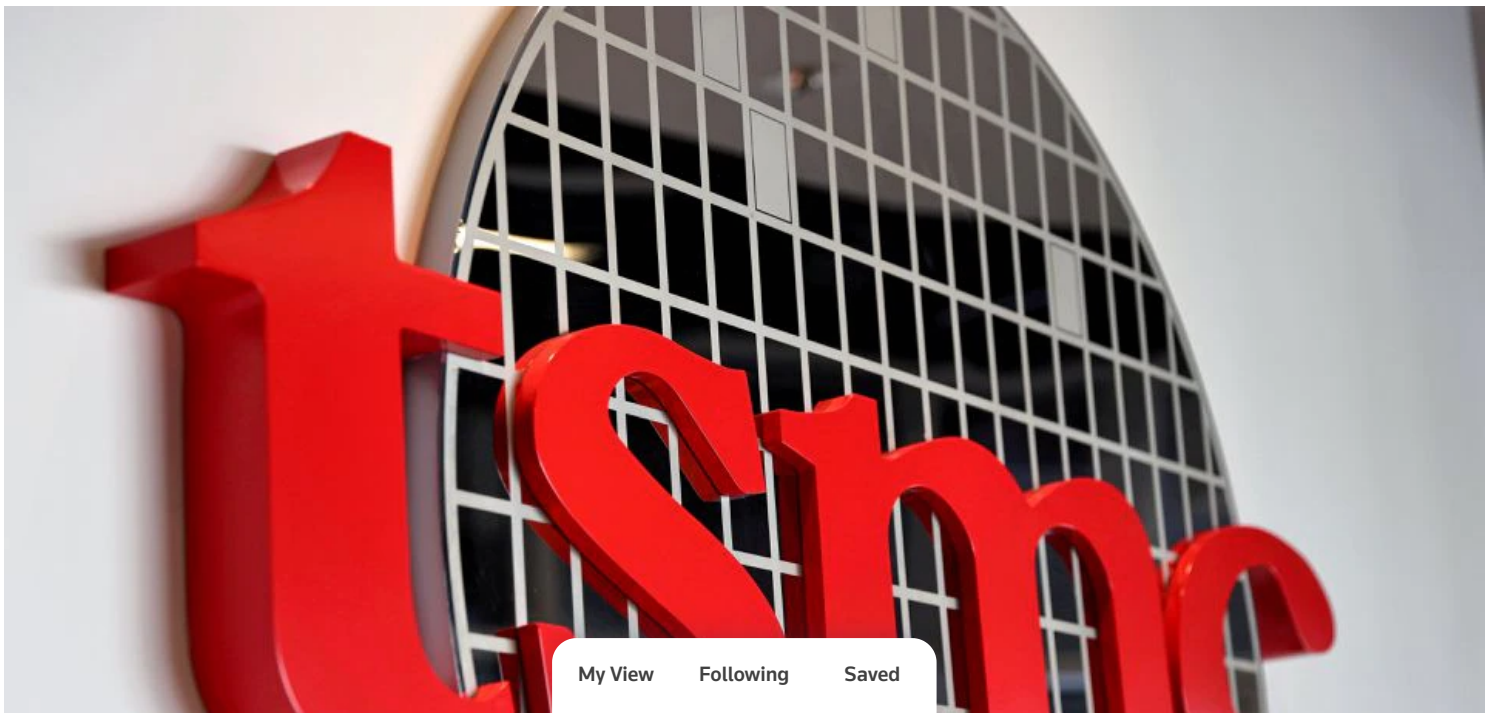
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TSMC chairman says nobody wants war over Taiwan as chip supplies too valuable

Reuters

4 minute read





The logo of Taiwan Semiconductor Manufacturing Co (TSMC) is pictured at its headquarters, in Hsinchu, Taiwan, Jan. 19, 2021. REUTERS/Ann Wang

TAIPEI, July 15 (Reuters) - Nobody wants to see a war over Taiwan because nobody wants to disrupt the crucial global supply chain of semiconductors, the chairman of major chipmaker TSMC ([2330.TW](#)), said on Thursday, in unusually direct comments about geopolitics.

Tensions over the past year or so have risen around Taiwan as China seeks to assert its sovereignty claims, with repeated military drills near the island that have caused concern in Washington and other Western capitals.

Mark Liu, Taiwan Semiconductor Manufacturing Co Ltd's chairman, told an earnings call that the COVID-19 pandemic has already been disruptive enough for the global economy and no country wants to see instability around Taiwan.

"As to an invasion by China, let me tell you everybody wants to have a peaceful Taiwan Strait. Because it is to every country's benefit, but also because of the semiconductor supply chain in Taiwan - no one wants to disrupt it."

TSMC, the world's largest contract chipmaker and a major Apple Inc ([AAPL.O](#)) supplier, is at the centre of global efforts to resolve chip shortages that have in some cases shuttered auto plants and affected consumer electronics.

The U.S. government has been pressing TSMC and other Taiwanese chipmakers to do more to ease the chip shortage, especially for automakers. [read more](#)

Asia's most valuable manufacturing company tends to try and stay out of politics, though it has large business interests in both China and the United States and has to ensure it does not run afoul of either government.



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TSMC, which has a market capitalisation of \$567 billion, more than double that of chipmaker Intel Corp ([INTC.O](#)), announced in May last year it would build a \$12 billion factory in Arizona, an apparent win for the then-Trump administration in its push to wrestle global tech supply chains back from China as part of a broader China-U.S. trade war.

Liu said that under the Biden administration, geopolitical developments were "more predictable, more rules-based".

In a rare departure from its core competency of chipmaking, TSMC signed a deal this week to import COVID-19 vaccines from BioNTech SE ([22UAY.DE](#)), in a venture jointly with another Taiwanese tech giant and Apple supplier, Foxconn ([2317.TW](#)).

Taiwan's government allowed the two to negotiate on its behalf following public pressure about the slow pace of vaccinations, and after Taipei blamed Beijing for blocking an earlier deal with the German firm. China denies that.

Liu said he was pleased the deal came together.

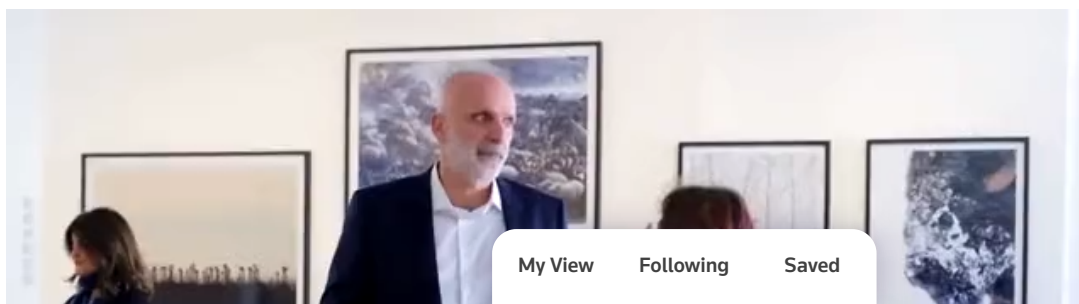
"This could be political in the beginning, but in the end we completed the contract and we did get support from all sides, so I don't think at the end it was as political anymore, otherwise this donation wouldn't be successful."

Once they arrive, the vaccines will be donated to the government for distribution.

Reporting by Ben Blanchard and Yimou Lee; Editing by Muralikumar Anantharaman

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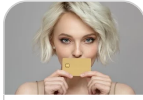
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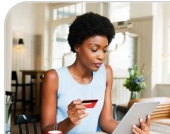
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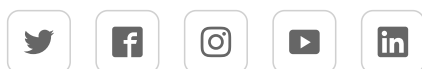
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