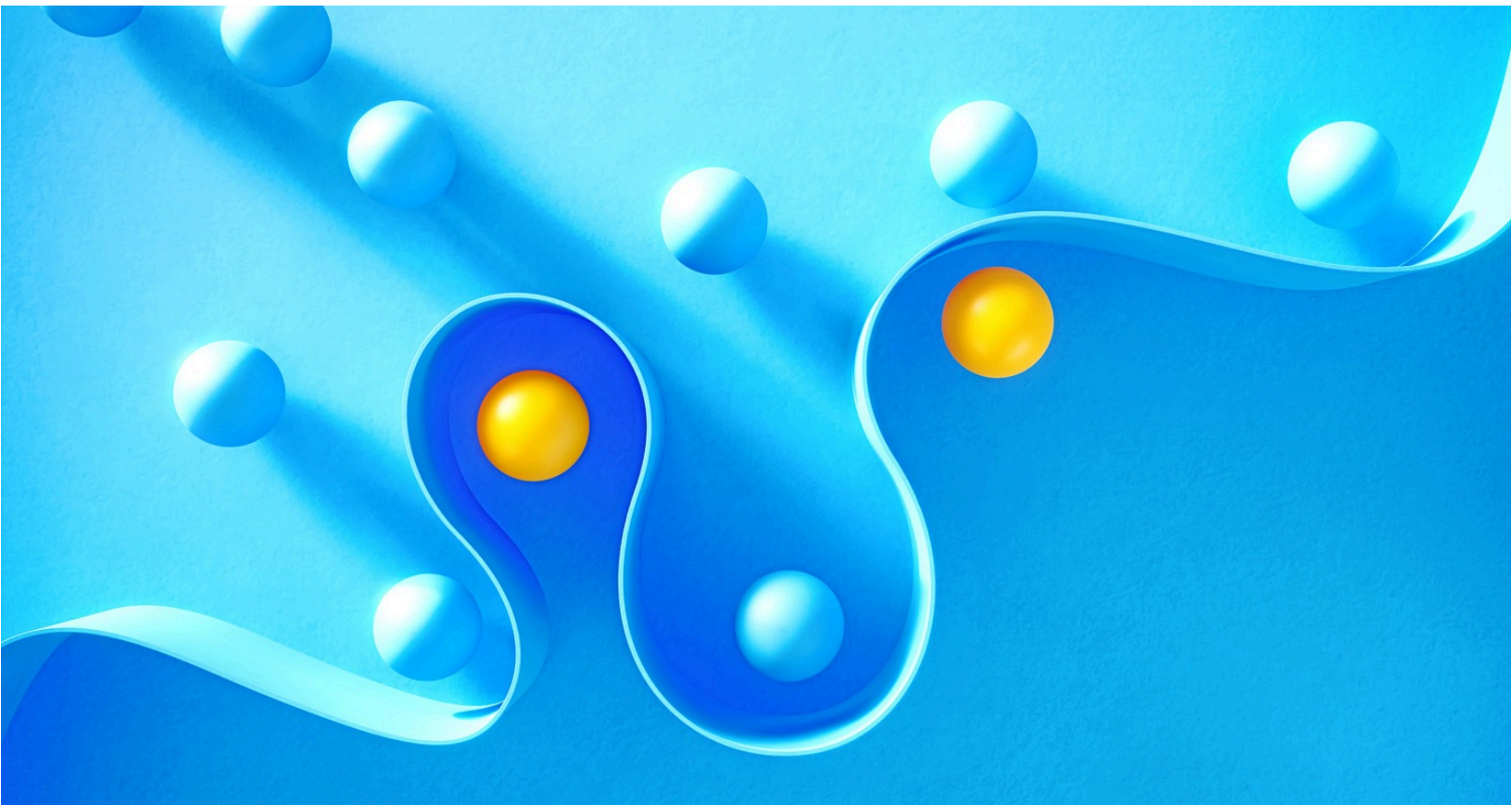


Geopolitics Practice

Restricted: How export controls are reshaping markets

The growing number of export restrictions is disrupting companies' market strategies and tangling their supply chains. Here's how CEOs can navigate the shifting landscape of global trade.

This article is a collaborative effort by Cindy Levy, Matt Watters, and Shubham Singhal, with Bryce Bittner, Doron Hindin, and Isabella Bennett, representing views from McKinsey's Geopolitics Practice.



As geopolitical tensions continue to mount, governments around the world are expanding restrictions on what domestic companies can sell abroad. Most business leaders are familiar with export controls affecting military or dual-use items (those that have both military and civilian applications). What is harder to untangle are the complex export control restrictions that governments can implement, or have already implemented, to promote policy goals affecting their countries' technological and economic security.¹

For example, export controls shaped the race to deploy mobile-communications infrastructure and are molding the global semiconductor, AI, and quantum computing industries. Legacy industries are also caught up in export controls, such as encryption rules that affect nearly all commercial software products. Moreover, governments continue to expand restrictions on the entities to which domestic companies can sell even purely civilian items. Since 2019, the United States has more than doubled the number of these restricted buyers. Then, last year, the European Union decided that EU companies have to assume responsibility for ensuring that their buyers prevent industrial and commercial items (such as video cameras and computer chargers) from reaching Russia and Belarus.²

The growing number of export controls poses significant challenges for companies' global strategies. Even trace amounts of restricted materials can cause products to face export restrictions. Export controls entail unique challenges relative to other trade controls. While, like [tariffs](#), they are often part of broad diplomatic negotiations, export controls are typically spurred by national-security concerns. Consequently, governments sometimes implement export restrictions unilaterally and with immediate effect, catching business leaders off guard.

Additionally, while most countries publish import data and customs duties—typically organized based on Harmonized System (HS) codes, an internationally recognized system of numbers and names used to classify traded products—information on export controls is less easily available and is generally not linked to HS codes. This makes trends difficult to spot and analyze. For example, as the United States increased controls on semiconductor exports to China, headlines predicted that US chip exports to that country would drop precipitously.³ However, the controls only targeted a narrow subset of advanced chips and focused largely on chip-making tools. The outcome, counterintuitively, was a boost in US chip exports to China in some years and had no noticeable impact on market trends in other years (Exhibit 1).

The growing proliferation of export controls contributes to an increasingly complex trade landscape that is [testing the resilience of multinational corporations](#). However, as we explore in this article, organizations that monitor and understand the implications of evolving export rules can seize opportunities and get ahead of less savvy competitors.

The fundamentals of export controls

Export controls apply to goods, services, software, and technologies. They limit the movement of sensitive products and services across borders, regulate foreign nationals' access to technology, and restrict these items from flowing to specific end users or for specific end uses. Export controls are distinct from investment controls—such as those on foreign direct investment,

¹ See, for example, Rt. Hon. Oliver Dowden, CBE MP, *Deputy Prime Minister's speech on economic security*, Chatham House, April 18, 2024 (highlighting export controls as a cornerstone of UK economic security).

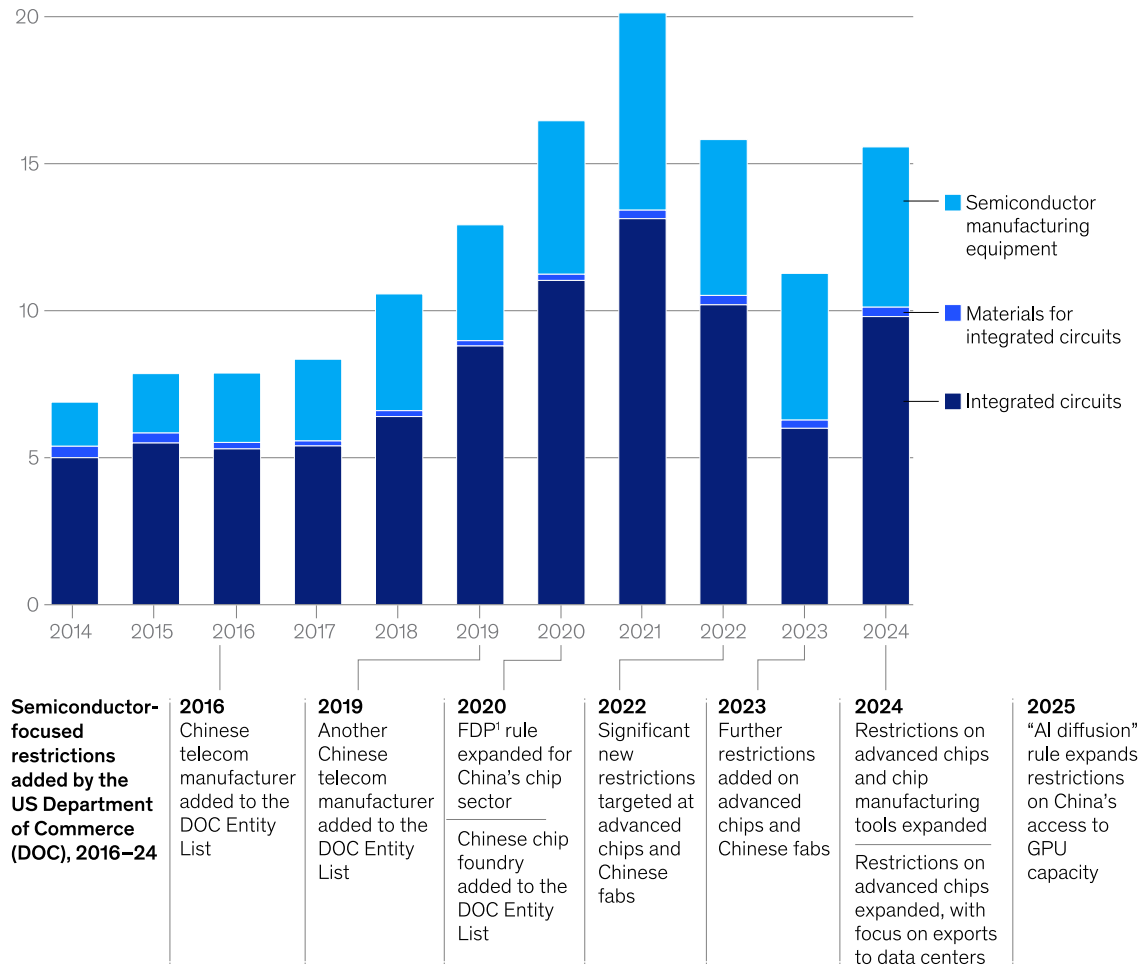
² "List of Common High Priority Items (Version of February 2024)," European Commission, February 22, 2024.

³ Stephen Nellis et al., "U.S. aims to hobble China's chip industry with sweeping new export rules," Reuters, October 10, 2022.

Exhibit 1

Recent US tightening of export controls on semiconductors has not reduced chip exports.

US semiconductor-related exports to China, \$ billion



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which focus on regulating the flow of capital—and from sanctions, which primarily restrict financial transactions.

While export controls have been around as long as embargoes, they became formalized after World War II amid the arms and technology race of the Cold War. In 1996, the Wassenaar Arrangement replaced Cold War–era export control frameworks to promote a unified and transparent system for stemming global proliferation of weapons and dual-use items. Alongside Wassenaar, which has 42 member states, several multilateral regimes govern the trade in missile technology and drones, nuclear fuel, and chemical and biological agents. However, recent geopolitical tensions have made it difficult for multilateral organizations to find consensus on control measures, particularly those affecting technology, prompting some member countries to impose unilateral or plurilateral controls.⁴ As a result, companies today have to navigate multiple international and domestic export control rules simultaneously.

Below are overviews of the key export control policies in the world's three largest economies:

- *United States.* The Departments of State, Energy, and Commerce regulate export controls on goods and services within their respective domains. The State Department manages the US Munitions List (USML) of sensitive military items; the Department of Energy oversees products and services related to nuclear energy in concert with the Nuclear Regulatory Commission; and the Commerce Department (DOC) manages the Commerce Control List (CCL), which includes less sensitive defense and dual-use items, as well as products not controlled by other agencies. In all cases, the agencies restrict not only domestically produced items but those made outside the country if those items meet certain thresholds of controlled US content. Companies can obtain export licenses, or use license exceptions in some cases, to export controlled goods to approved destinations and end users.
- *China.* In 2020, China enacted the Export Control Law and followed up with detailed regulations in October 2024. The Ministry of Commerce (MOFCOM) manages China's primary lists of controlled items, issues licenses, and enforces restrictions on exports. It has emerged as the leading agency in China's response to Western export controls targeting its advanced industries and has been imposing increasing constraints on Western companies.⁵ MOFCOM, in collaboration with China's customs administration, has also imposed restrictions on the export of rare earth minerals and key materials used in the semiconductor supply chain.⁶
- *European Union.* The European Commission Directorate-General for Trade (DG Trade) coordinates EU-wide export controls that are implemented primarily by member states. Those states can also supplement EU controls. In March 2023, for example, the Netherlands followed the United States' lead in imposing controls on semiconductor technologies not restricted by other EU members, and the following year, France instituted export controls on quantum-computing-related technology.⁷ A notable shift occurred in November 2024, when the European Union required companies to ensure that their customers do not sell certain

⁴See for example, "Commerce Control List additions and revisions; Implementation of controls on advanced technologies consistent with controls implemented by international partners," 89 Fed. Reg. 72926, September 6, 2024 (introducing a new framework in the Export Administration Regulations to "identify items for which controls are harmonized [with subsets of] of international partners, and to distinguish between such items and those items controlled through multilateral regimes," such as Wassenaar).

⁵For example, on March 4, 2025, pursuant to the China Export Control Law of 2020, MOFCOM applied end-user export control restrictions on 25 US companies.

⁶Amy Lv and Lewis Jackson, "China's curbs on exports of strategic minerals," Reuters, February 4, 2025.

⁷"Order of February 2 relating to exports to third countries of goods and technologies associated with quantum computers and their enabling technologies and equipment for the design, development, production, testing, and inspection of advanced electronic components," *Official Journal of the French Republic*, February 2024, Volume 34, Number 8.

products to Russia or Belarus—the agency’s highest-profile application of extraterritorial authority to date.⁸

Export control trends affecting global trade

Multinational corporations and global exporters and importers face an increasingly complex trade environment. The three main causes are the proliferation of restrictions, the fracturing of alliances, and the growing application of extraterritorial authority.

- *Proliferation of restrictions.* A major trend in export controls is their sheer expansion. Lists of restricted items issued by multilateral organizations are steadily increasing in size, scope, and complexity. Each year brings controls on new product groups,⁹ even as legacy products continue to be covered by controls. For example, encryption that uses 56-bit symmetric key algorithms remains on restricted lists even though the algorithm has been widely available since the 1970s.

The parallel growth in unilateral measures has further complicated the export control landscape. Even companies selling identical products can be subject to different export restrictions. For example, new US restrictions on gen AI products stipulate different rules depending on where a company operates.¹⁰ The US CCL, which mirrored the multilateral Wassenaar’s Munitions List in the 1990s, now contains hundreds of additional US-specific entries. The DOC’s Entity List—a compilation of foreign companies and organizations subject to export restrictions—has grown from 1,350 entries in 2019 to approximately 3,350 as of March 2025 (Exhibit 2). China, Japan, and the Netherlands, among many other countries, have likewise expanded their own controls on key industries such as semiconductors and nuclear energy.¹¹

- *Fracturing of alliances.* Historically, export controls were part of multilateral regimes, which tended to create level playing fields for companies from technologically advanced countries. However, geopolitical tensions and technological competition are leading some governments to increase coordination. For example, the United States organized a coalition of countries to implement targeted export controls in response to the Russian invasion of Ukraine.¹² Later, the boom in gen AI brought new US restrictions on companies operating in countries with high computing power¹³ but excluded some US allies. Such shifts in alliances complicate companies’ strategic planning and ability to navigate geopolitical trends.
- *Growing extraterritorial authority.* Regulations that extend beyond a country’s borders present another compliance challenge for exporters. The US Department of State, for example, applies the so-called see-through rule under its International Traffic in Arms Regulations (ITAR). The rule controls defense products manufactured outside the United States if they contain even trace amounts of controlled US content. The experience of a European

⁸ *Strategic plan 2020-2024*, European Commission, September 14, 2020.

⁹ For example, compare the 200-page Wassenaar List of Dual-Use Goods and Technologies and Munitions of 1996 with the 244-page list of 2024.

¹⁰ Defined as countries with “large clusters of advanced computing ICs,” calculated as “total processing power” in accordance with Department of Commerce regulations: AI Diffusion Rule, 90 Fed. Reg., 4544, 4546 and 4551, January 15, 2025.

¹¹ “Japan plans to expand export controls on chips, quantum tech,” *Tech in Asia*, January 31, 2025; Clyde Russell, “China kills energy trade with the US, but initial impact is limited,” *Reuters*, February 4, 2025.

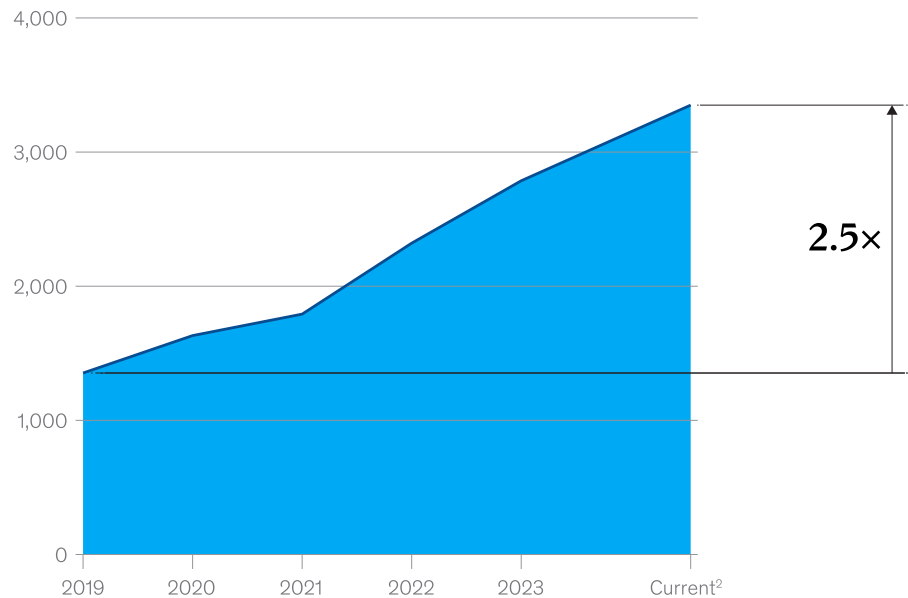
¹² “Commerce announces addition of Iceland, Liechtenstein, Norway, and Switzerland to Global Export Controls Coalition,” US Department of Commerce press release, April 8, 2022.

¹³ Defined as countries with “large clusters of advanced computing ICs,” calculated as “total processing power” in accordance with Department of Commerce regulations. See “Framework for Artificial Intelligence Diffusion,” 90 Fed. Reg. 4544, 4546, and 4551, January 15, 2025.

Exhibit 2

The US Department of Commerce Entity List has more than doubled in size over the past five reporting years.

Bureau of Industry and Security, number of active entries at the end of fiscal year¹



¹Approximations based on congressional budget submissions.

²As of March 25, 2025.

Source: Bureau of Industry and Security

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aerospace manufacturer serves as a cautionary tale. The company advertised its satellite system as “ITAR free,” only to learn that due to a tiny controlled subcomponent, the entire system was subject to US export restrictions and could not be exported to or deployed in China as planned.¹⁴ The DOC has its own complex regulations covering non-US items, such as the “de minimis” and the “foreign produced direct product” (FDP) rules.¹⁵ Those rules extend US jurisdiction to items made outside the United States if they contain certain levels of controlled US content or were produced using US expertise or tools (even absent any US content).

China’s recent export control regulations likewise extend to activities outside China, roughly tracking the DOC’s de minimis and FDP rules. Meanwhile, as noted above, the European

¹⁴ Jim Wolf, “Exclusive: U.S. squeezes French-led satellite maker over China,” Reuters, February 10, 2012.

¹⁵ De minimis and FDP rules are regulated pursuant to Part 734 of the Export Administration Regulations.

Union now requires European companies to monitor extraterritorially to ensure their products aren't used in Russia or Belarus.¹⁶

How export controls are disrupting industries

For nearly a decade, the United States and China have been implementing escalating export controls related to semiconductors, telecommunications, and advanced manufacturing. The impact on businesses in both countries has been significant. A study by the Federal Reserve Bank of New York found that when US companies' Chinese customers were placed on export control lists, the US companies' stock prices dropped by an average of 2.5 percent.¹⁷ The study's authors estimate that such controls cost the average affected American supplier \$857 million in lost market capitalization, with total losses to all suppliers of nearly \$130 billion.

Many companies have experienced disruptions due to the recent flurry of American, Chinese, and European export controls. For example, Western Digital and Toshiba elected to halt sales to the Chinese telecommunications industry after the United States introduced export controls in 2020. Seagate, by contrast, opted to continue selling to a Chinese company through offshore affiliates. The US government concluded that Seagate breached the FDP rule, leading Seagate to pay a penalty of approximately \$300 million. In another case, when the American, Dutch, and Japanese governments imposed restrictions on Chinese semiconductor manufacturing, SMIC, China's largest semiconductor manufacturer, saw a drop in revenue and pivoted to different markets.¹⁸

While export controls can produce short-term disruptions in line with policymakers' goals, the longer-term impact may run counter to those objectives. The emergence of China's DeepSeek as a competitive AI model, for example, suggests that US export restrictions may have accelerated domestic innovation by spurring Chinese firms to develop alternatives to restricted foreign technologies.¹⁹

How companies can proactively address export controls

The growing number and complexity of global export controls make it crucial for business leaders to assess the impact of such measures and mitigate any associated risk. They should also seek to identify potential competitive opportunities. To this end, companies should consider the following steps.

Adapt product design to account for export control risk

Decision-makers should consider whether including sensitive technology in their products could make those products subject to export controls. They should also reexamine assumptions about target markets included in the original investment case in light of emerging trade restrictions. Since export controls can cover product inputs and components, and even the tools used in production, business leaders may need to make contingency plans across the entire product footprint.

¹⁶ Jasper Helder et al., "Extraterritorial application of EU sanctions targeting Russia," Akin Gump Strauss Hauer & Feld LLP, November 28, 2024.

¹⁷ Matteo Crosignani, Lina Han, Marco Macchiavelli, and André F. Silva, *Securing technological leadership? The cost of export controls on firm*, *Federal Reserve Bank of New York Staff Reports*, February 2025, Number 1096.

¹⁸ Matthew Connatser, "Chinese foundry SMIC is bruised but not broken by U.S. sanctions—revenue still much higher than in 2021 and 5nm node on track," *Tom's Hardware*, March 1, 2024.

¹⁹ Michael Froman, "DeepSeek: Making sense of the reaction—and overreaction," *Council on Foreign Relations*, January 31, 2025.

Reassess the supply chains of existing products

Executives should review their supply chains for dependencies on components and suppliers that could be subject to restrictions. They should also consider risks beyond regulatory compliance. Implementing software that checks whether customers are on export restriction lists, for example, will not highlight broader vulnerabilities in high-priority but potentially high-risk export markets. On the flip side, some companies may see opportunities emerge from new restrictions affecting foreign competitors. For example, in December 2024, China banned exports of gallium, germanium, and antimony to the United States in response to US outbound investment restrictions.²⁰ The following month, the US government granted a mining permit to a domestic company to explore for sources of antimony within the country's borders.²¹

Understand how export controls can affect your (and your competitors') operations

Keeping abreast of evolving trade controls, geopolitical alliances, and their respective impact on markets has become central to maintaining corporate resilience. Export controls' impact can go beyond supply chains and the ability to export products to specific markets—it can also affect research and development, manufacturing, and people operations. For example, US export controls may have led Chinese companies to invest in developing technologies domestically that they could no longer import. Research shows that Chinese companies affected by US export restrictions increased R&D spending by an average of 16.6 percent as a percentage of revenue in the year the controls were introduced.²²

Ensure legal and compliance teams are up to the task

The compliance function is critical to managing the impact of export controls—not only to avoid costly fines but to create potential competitive advantages. When legal and compliance professionals are properly trained on export controls, they can help their employers capitalize on new market opportunities by efficiently navigating complex regulations and license application processes. For example, when the US government added Chinese technology companies to the DOC's Entity List in 2019 and 2020, their US suppliers faced the prospect of significant sales losses. Yet, in the six months between November 2020 and April 2021, some companies with agile compliance functions were able to submit complicated applications for export licenses and ultimately obtain DOC approvals to export more than \$100 billion worth of semiconductor-related products to the restricted Chinese manufacturers. In 2022, when new restrictions targeted Chinese chip manufacturers, some foreign companies ceased collaboration with Chinese fabs, but Intel, Samsung, SK Hynix, and TSMC, among others, obtained regulatory waivers to continue work.

²⁰ Amy Lv and Tony Munroe, "China bans export of critical minerals to US as trade tensions escalate," Reuters, December 3, 2024.

²¹ Ernest Scheyder, "Exclusive: Biden officials issue permit for Perpetua's Idaho antimony and gold mine," Reuters, January 3, 2025.

²² Han Hu, Shihui Yang, Lin Zeng, and Xuesi Zhang, "U.S.–China trade conflicts and R&D investment: evidence from the BIS entity lists," *Humanities & Social Sciences Communications*, 2024, Volume 11, Number 928.

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The increasingly complex export control environment complicates companies' global strategies. To mitigate risk while seizing potential opportunities, business leaders should assess their product designs and go-to-market strategies in light of ever-changing restrictions and anticipate geopolitical shifts that can spur additional regulations.

This article is a summary for general informational purposes and does not constitute legal or regulatory advice.

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