AUSTRIAN INSTITUTE FOR EUROPEAN AND SECURITY POLICY

Nr. 2026/1

Super Chips and Supply Chains

Europe's Semiconductor Paradox of Geoeconomic Entanglement

by Samuel Kerschbaumer

January 2026

AIES FOCUS

Super Chips and Supply Chains
Europe's Semiconductor Paradox of Geoeconomic Entanglement

1. Introduction

Semiconductors are the base materials from which microchips are produced, enabling the transistor circuits that form the core of modern electronic systems. Originally developed and manufactured within the United States (U.S.) military-industrial complex, they soon diffused into civilian markets. As global demand expanded and cost pressures intensified, both U.S. and European firms progressively offshored significant parts of their manufacturing to Asia, where large scale and cost-efficient fabrication capacity rapidly emerged. Their production follows three main stages: design, fabrication on silicon wafers using materials such as photoresists and metals, and final assembly, packaging, and testing.[1]

As this supply chain globalized and specialized, its strategic vulnerabilities became increasingly exposed. Since early 2025, China has progressively expanded export controls on selected rare earth elements, beginning with licensing requirements and later extending them to broader regulatory measures, on which semiconductor production is so reliant on. The October 2025 announcement marked a politically motivated escalation. Given China's overwhelming dominance in the mining and refining, these controls grant it near total leverage across the global value chain and must be understood in the context of intensifying U.S. trade restrictions, including tariffs and targeted export restrictions. [2]

As Farrell and Newman[3] observe, the U.S. has long weaponized its control over critical economic and technological infrastructure, creating a broader environment in which reciprocal escalation has become more likely. Yet, as global interconnections deepen, emerging powers like China are gaining strategic leverage of their own, increasingly turning these same mechanisms against the West.[4] This growing strategic agony is most visible in the struggle over the highly fragmented semiconductor supply chains, where different regions have specialized on different segments of production.

In the sector of chips, Europe's strengths are concentrated in downstream automotive and industrial applications, where it leads in demand and system integration rather than advanced fabrication. China's position is strongest in large-scale manufacturing, supported by systematic investment aimed across the entire value chain.[5] The U.S., by contrast, retains global leadership in chip design and the associated intellectual property base,[6] while nearly 90% of the world's most advanced fabrication remains concentrated in Taiwan's TSMC.[7]

Within this context, Europe's dependence on U.S. intermediaries leaves it exposed to China's coercion, with the latter increasingly treating Europe as a strategic target rather than collateral damage.[8] Advanced industries in the European military and civilian sector rely heavily on the import of natural resources by third countries, especially in the technological ecosystem. When it comes to semiconductors, the computing backbone of microchips, access to raw materials inputs necessary for fabrication has become indispensable for power politics and Europe's ambition on the global stage.[9]

In order to balance asymmetries and dependencies stemming from the specialization cleavage, states have increasingly adapted interventionist policies that blend public financing, strategic coordination, and industrial policy. To overcome weaponization within the semiconductor supply chain, governments around the world have been pushing toward self-sufficiency through large public investment and subsidy schemes. The US Chips Act mobilizes $280 billion in research and manufacturing and has encouraged similar schemes in Asia and Europe, where the European Union (EU) has boosted the semiconductor industry by €43 billion in investment to increase its global share from ten percent to 20 percent.[10]

However, a full technological separation is regarded as both unrealistic and uncompetitive, since establishing a localized supply chain would require at least $1 trillion in upfront investment and could raise prices by

as much as 65 percent.[11] These measures conflict with Europe's preference for open markets, impose excessive costs for companies, and threatens access on Chinese material inputs, particularly in sectors such as automotive and industrial manufacturing.[12]

Against this backdrop, China has become the principal driver of this trend. As the biggest importer of chips worldwide, Beijing has pushed state-led policies directed toward an autarkic semiconductor ecosystem. Its extensive state subsidies, centralized planning structures, and drive toward military-civil fusion have reshaped conditions across semiconductor industries and foreign policy, forcing other major economies to recalibrate their own approaches. The rapid advancement in both next-generation memory and logic chips directly threatens to erode Europe's global market competitiveness and technological autonomy.[13]

Furthermore, Europe is challenged by a dual dynamic: As the trade and tech war between China and the United States escalates, it risks turning international trade into a race to the bottom. Donald Trump's transactional, and business-oriented approach places growing pressure on long-standing transatlantic economic ties. At the same time, new security and political alignments are taking shape beyond the West. For Europe, this evolution underscores a strategic dilemma centered on semiconductors themselves. Their economic and security significance increasingly makes them a source of vulnerability and external pressure in a contested world order, forcing the European Union to balance strategic autonomy and its commitment to liberal trade.

While risks related to the One-China policy accentuate the dependence on Taiwan, Europe's push to expand domestic chip capacity is fundamentally driven by the need to maintain technological and industrial competitiveness in the semiconductor market. When different players increasingly control bottlenecks across supply chains, especially when they are embedded in opposing alliance structures, the risk of weaponization increases substantially.

> As this supply chain globalized and specialized, its strategic vulnerabilities became exposed.

Launched in early 2025 by nine EU countries, the Semiconductor Coalition was recently joined by all 27 Member States (MS) on September 29, 2025, through a joint declaration calling for a revised and forward-looking Chips Act 2.0 to strengthen European competitiveness and strategic resilience.[14] As the European Commission's (EC) review process for the Chips Act is currently open,[15] this moment offers a timely opportunity to assess and reinforce Europe's semiconductor policy. Anchored in the European Chips Act,[16] it reflects both its vulnerabilities and ambitions in the pursuit of technological sovereignty. The emerging policy consensus among MS underscores Europe's determination to strengthen its control over critical technologies in the face of intensifying global competition.

The current moment requires a level of situational awareness that brings together geopolitics, economics, and diplomacy in a single analytical frame. Semiconductor policy does not operate in an isolated industrial domain but within a wider strategic environment shaped by global power competition, contested supply chains, and rapid technological change. Effective policy-making therefore depends on understanding how external pressures interact with internal European constraints and how economic decisions translate into long-term strategic consequences. This integrated perspective is essential for assessing the risks and opportunities of Europe's position in the global semiconductor landscape and for determining which instruments and strategy can realistically strengthen resilience and competitiveness over the long-term.

2. From Interdependence to (In)security

Fostered by globalization, security and economic interests have become inseparable. A new wave of industrial policy is unfolding, as states seek to revise, diversify, and strengthen key

supply chains in pursuit of resilience. Driven by the rivalry between the United States and China, the emerging geoeconomic logic underscores the extent to which interdependence has been reframed as a vector of vulnerability.

Given this structural configuration, geoeconomics refers to the strategic deployment of economic tools to advance and protect state interest to shape geopolitical outcomes.[17] These developments form part of a larger reorientation in global economic governance. A central example of this shift is the United States' changing policy toward China, which has shifted from concern to active restriction over the past years.

Under the first Trump administration, Washington introduced the Export Control Reform Act of 2018 and moved to exclude Huawei and ZTE equipment from U.S. networks. This strong signal was expanded by the Biden administration which placed semiconductors at the center of U.S. economic statecraft. The CHIPS and Science Act of 2022 aimed to re-shore priorly outsourced domestic production, while the October 2022 export controls set further limits on China's access to high-end chips.[18] In this context, the United States' decision to restrict Huawei's access to advanced semiconductor technology became a defining example of the weaponization of production networks. Huawei's position in 5G infrastructure was perceived as a security risk for the U.S., which responded by targeting the supply chain where Chinese firms were most dependent on foreign technology.

The very structure of the industry made this approach effective: Semiconductor production is divided into specialized segments such as design, Electronic Design Automation (EDA), and machine equipment. Foundries rely on long established relationships with a limited group of EDA vendors, mostly from the U.S. Because the high entry barriers for equipment markets, Huawei had no viable substitutes once controls were introduced and lost market competitiveness.[19] This case shows how weaponization works in practice and illustrates a broader lesson for economic statecraft: Strategic influence depends on identifying concentrated dependencies within value chains, coordinating with allied producers, as well as institutional, diplomatic, and industry coordination.

China's response has been expansive and increasingly coordinated across multiple policy fronts. The CCP declared self-reliance as a core national security priority through the "Made in China 2025" framework and successive Five-Year Plan, which identify chips as a strategic technology. The state expanded the resources of the National Integrated Circuit Industry Investment Fund (Big Fund), which is complemented by a growing network of provincial and municipal investments and supports fabrication, equipment development, and design. Further, access to capital, tax incentives, and procurement rules were introduced to favor domestic producers. In addition, China launched targeted substitution programs and strengthened funding for institutions working on advanced research.[20]

This shows, that while U.S. controls created immediate constraints, China also accelerated efforts to build a more autonomous and resilient semiconductor base. This strategy aims to reshape the competitive landscape by reducing China's long-term exposure to external chokepoints, strengthening its capacity to withstand technological pressure, and increasingly shape international norms and rules in the high-tech sector.

China's rapid expansion in semiconductor manufacturing is reshaping the competitive landscape in which Europe operates. While the EU remains strongest in equipment and specific industrial chips, it continues to rely heavily on external suppliers for most logic and memory production. Meanwhile, China has combined large scale investment with state backed industrial policy to build a significant capacity at mature technology nodes and to strengthen its position in materials and components. This shift challenges Europe in two ways. First, Chinese producers are becoming major suppliers of the legacy chips that underpin Europe's automotive and industrial sectors, reinforcing vulnerabilities experienced during recent supply disruptions. Second, China's quasi-monopolization over critical inputs such as rare earths and minerals reveals

how dependent Europe remains on materials for high value manufacturing.[21]

3. Geoeconomic Agency: Instruments and Tools

The geoeconomic use of export controls has become a central source of tension between the United States, China, and the EU, restricting technology transfers and intensifying national strategies aimed at maintaining technological primacy by limiting others' ability to catch up. Because of its structural power within global networks, in most cases the U.S. can set the terms of export-control regimes. Established multilateral frameworks, such as the Wassenaar Arrangement for export controls, are gradually being replaced by bilateral or specific rulings.

When it comes to semiconductor geoeconomics, the U.S. has relied on three main instruments. First, is has restricted access of Chinese firms to advanced technology by adding them to the Entity List, Washington's unilateral trade restriction instrument administered by the Bureau of Industry and Security (BIS) within the U.S. Department of Commerce. Second, Washington has applied diplomatic pressure on allied governments to adopt similar export limitations—After negotiations with the Netherlands and Japan, the governments announced that the export of ASML's lithography systems to China would no longer be allowed, showcasing extraterritorial reach. Third, the U.S. has enforced its own legal controls on allies, especially for European industries: on October 2023 it applied U.S. export rules to a class of ASML machines that were not restricted under Dutch law, effectively assuming regulatory authority over those exports.[22]

This reality places European firms under growing legal and operational pressure, as the U.S. could limit access to advanced technologies and weaken the EU's ability to implement its own industrial strategies. Taken together, these measures amount to a form of external coercive binding. European firms that ship products to China without a U.S. license face significant penalties, which are referred to as negative sanctions, coercing alignment with U.S. policy and limiting European companies operating in third countries. This dynamic is particularly relevant for AMSL, but it also affects other major semiconductor producers in Europe. Pressure on the Netherlands to restrict ASML's exports placed Europe inside Washington's economic statecraft and exposed how a key European chokepoint can be shaped by external influence.

Within this turmoil, the EU is by no means exempt from the geoeconomic dynamic.[23] While the Union continues to adhere to the mechanisms of the liberal order and publicly presents itself as "reliable, predictable and open for fair business"[24], it nonetheless acknowledges that it operates in "a world in which dependencies are ruthlessly weaponized"[25].

The EU has demonstrated that it possesses the agency to respond, notably through its economic instruments deployed by the central authorities. The European Union has sought to advance its economic security through the 2021 concept of Open Strategic Autonomy[26] and the 2023 Economic Security Strategy[27], which according to Höra and Weiss[28] rest on two pillars: internal resilience built on the strength of the European market and the external deployment of foreign economic tools that provide deterrence and, if necessary, enable retaliation.

This approach is visible in the protection of sectors such as semiconductors, where technological sensitivity and supply chain exposure are high. Controls on technology transfers remain tied to the Wassenaar Arrangement, and several member states use stricter national regimes that limit the diffusion of advanced technologies. The reform of the blocking statute aims to protect European firms from the extraterritorial reach of United States sanctions, although its effectiveness has been limited because companies seek to avoid jeopardizing access to the US market. In addition, the EU relies on measures that protect against unfair trade practices, including countervailing duties targeting foreign subsidies and anti-dumping measures addressing distortions in critical inputs. Together these steps reflect the Union's effort to enhance economic security in an industry that carries significant geopolitical implications.

Several recent cases highlight how the EU has strategically employed economic instruments to advance geopolitical objectives. These include the establishment of foreign direct investment screening mechanisms,[29] the sanctions-regime against Russia following its invasion of Ukraine,[30] the introduction of tariffs on Chinese electric vehicles,[31] or the Carbon Border Adjustment Mechanism.[32]

4. Inside the Geoeconomics of Chips

During the chip shortage triggered by the Covid-19 pandemic, stakeholders became acutely aware of the fragility of semiconductor supply chains, causing an estimated €100 billion in losses to European carmakers in 2021 and 2022 alone.[33] Russia's war of aggression and the ensuing export controls on semiconductors have further underscored their dual-use nature, revealing that these technologies are no longer civilian commodities but can be integral instruments of geopolitical strategy.

Recent analysis shows that global supply chains now function as core arenas of geopolitical competition, where in many scenarios economic statecraft has replaced direct military confrontation. Dominant states seek to preserve their position by restricting access to strategic technologies. This dynamic, however, can be self-defeating, as economic coercion often accelerates the rival's modernization. In the semiconductor sector, U.S. policies illustrate this paradox: Measures intended to constrain China's rise have spurred progress in domestic chip production and AI capabilities. As both powers pursue strategic decoupling, the competition for technological leadership fragments global supply networks into rival blocs, shaped as much by business incentives as by state strategy.[34]

As the backbone of modern technology, semiconductors shape among other things, the race for AI supremacy. Leading chipmakers collectively represent more than $6.5 trillion in market capitalization.[35] Over the past years, global equity markets have increasingly concentrated around a handful of firms driving advances in AI. The performance of technology indices now rests disproportionately on corporations like Apple, Microsoft, Meta, Amazon, and Tesla, whose valuations depend on continuous access to cutting-edge chips. This position, however, conceals an acute structural vulnerability within the global value chain: Nvidia, like Apple, focuses exclusively on design, while manufacturing is almost entirely outsourced. This concentration reinforces a global configuration dominated by a few capital-intensive U.S. and Asian firms, leaving Europe at a structural disadvantage, struggling to match the scale of investment that underpins technological leadership.

Although the trade war has slightly dampened semiconductor market growth, the industry is still projected to reach €1 trillion in annual revenue over the next years. Recent shortages mainly affected older, less advanced chips, and supply has largely stabilized. Future growth is now driven by data centers, which rely on cutting-edge semiconductors.[36] As a globally interconnected industry, the supply chains span more than 50 countries and different regions specializing in distinct stages of production, from chip design to fabrication and assembly.[37] The leading players in the semiconductor ecosystem are the United States, South Korea, Japan, the EU, China, and Taiwan. Meanwhile, more countries—including ASEAN members,[38] India,[39] and Mexico[40]—are adopting national semiconductor strategies to expand their position in the supply chain.

While many nations are integrating semiconductor supply chain resilience into their economic security strategies, the quasi-monopolization along chokepoints critically limits the scope for action: Alongside TSMC, Samsung is the only other firm capable of producing chips below five nanometers. Yet, even Samsung has struggled to match TSMC's yields and reliability; Samsung's three-nanometer process proved inefficient, prompting a return of many producers to TSMC's higher-yield fabrication lines, underscoring the structural asymmetry and the undisputed market dominance of TSMC's advanced chips.[41]

In fact, producing these chips requires precision that exceeds conventional industrial standards: to put it at scale, a human

hair measures around 70.000 nanometers, while the industry is approaching the engineering of two-nanometer transistors.[42] The machinery involved in this process, such as EUV lithography systems supplied by ASML can cost up to $400 million per unit,[43] and, like other stages in fabrication, depends on decades of accumulated expertise, massive capital inputs, and ultra-specialized supply chains, giving established firms an incumbent advantage

This hyper-concentration of production capacity introduces systemic fragility into the global economy. Although new facilities are being built in the United States, Japan, and Europe, physical infrastructure alone cannot replicate the knowledge, engineering culture, and supplier network that underpin Taiwan's dominance. Donald Trump's recent remarks regarding security guarantees and tariffs on the chip industry have hampered U.S.-Taiwan relations. Promoting large-scale production remains a core objective of U.S. industrial policy, exemplified by the $100 billion investment commitment secured from TSMC. At the same time, he questioned U.S. security guarantees for Taiwan and signaled that subsidy for foreign firms may be withdrawn. Taipei now seeks clearer assurances that closer economic cooperation will not weaken political support, while TSMC faces uncertainty over funding and strategic autonomy. For Taiwan, keeping key manufacturing at home remains essential to preserve both technological leverage and national security.[44]

However, the delays at TSMC's plants in the U.S. illustrate the magnitude of the re-shoring challenge. Even with substantial financial incentives, shortages of specialized skill and experience risks delaying meaningful output for years.[45] In the United States and Europe, building and operating semiconductor fabs remains significantly more expensive and slower than in East Asia. Up-front capital costs are around ten percent higher than in Taiwan, and operating costs are roughly 35 percent higher, mainly due to energy prices, maintenance, and labor. Construction timelines are also longer, with European fabs typically taking 40 to 50 months to reach volume production compared with about 30 months in Asia. Most recent investments have focused on advanced manufacturing rather than semiconductor materials, increasing Europe's reliance on Asian suppliers for key inputs. [46]

On the other hand, the intensifying technological rivalry between the U.S. and China has especially compelled East Asian economies due to their proximity to redefine the balance between economic interests and security imperatives. The semiconductor sector has become the core of this reconfiguration, as production and innovation networks now determine both industrial competitiveness and geopolitical resilience. Across Asia, the interaction between a state's industrial position within the chips value chain and the degree of integration between economic and security imperatives explains the distinct strategic courses taken in response to the Chip War.[47]

Taiwan has aligned closely with the United States, using its foundry dominance as both an economic engine and a security instrument. Semiconductors are treated as a strategic asset, rather than tradeable commodities, allowing Taipei to leverage technological indispensability to strengthen deterrence and deepen its security ties with Washington. South Korea, by contrast, follows a hedging approach that seeks to reconcile its military alliance with the U.S. and its commercial dependence on China. The country's position in memory-chip production exposes it to the risk of technical restrictions and market disruption, leading Seoul to balance alignment with diversification to preserve industrial competitiveness.

Singapore maintains a deliberately separated relationship between economy and security. As a downstream packaging hub, it attracts investment from both major powers and presents itself as a neutral site within a polarized supply chain, aiming to enhance its relevance through openness rather than geopolitical alignment. Japan, after decades of economic accommodation with China, has reintegrated its economic and security strategies and moved decisively into coordination with the United States. By restricting exports of advanced equipment to China

and revitalizing domestic R&D and production, Tokyo seeks to recover a leading role in high-tech manufacturing and reduce strategic dependence.[48]

Japan's approach stands out among Asian semiconductor production for its emphasis on technological indispensability rather than production volume. Japan seeks resilience through control of upstream technologies and key industrial inputs. Central to this strategy is the pursuit of *strategic indispensability*—the objective of ensuring that Japanese firms occupy positions within global supply chains that are too critical to replace. This logic builds on comparative strengths in materials, precision equipment, and chemical components. A notable example is the acquisition of JSR, a leading photoresist producer, by the state-backed Japan Investment Corporation. The move aims to safeguard essential capacities and consolidate domestic expertise in areas where Japan remains globally competitive. Japan's policy concentrates on securing technological nodes that underpin the wider ecosystem. The success of the model built on resilience through indispensability can be measured not by market share, but by the extent to which Japanese firms remain essential to global chips production.[49, 50]

A central element often overlooked in the Chip War is the role of multinational companies as independent geoeconomic actors. Their position inside highly concentrated and technologically complex value chains gives them strategic influence that neither governments nor markets can easily replace. Economic statecraft therefore depends on how these companies interpret and respond to geopolitical pressure. The Business Security Dilemma clarifies this dynamic by showing that firms calculate the costs of losing access to U.S. technology and security cooperation alongside the costs of losing access to the Chinese market. In South Korea and Taiwan, firms cooperate closely with United States export controls because their governments rely heavily on United States security guarantees. In Europe, firms face a different environment. Firms in the Netherlands and Germany adapt selectively to United States restrictions while seeking to preserve its commercial presence in China, showing a pattern of cautious adjustment.[51]

These examples illustrate that multinational companies are not passive recipients of state policy but operational actors who can determine how far economic statecraft can extend across global production networks, with their choices shaping the strategic room for maneuver of semiconductor producing states. With all the debates over the return of economic statecraft, it remains easy to overlook how its practice has shifted toward more dispersed and territorially grounded forms of governance. Statecraft in the semiconductor sector increasingly operates through infrastructure policy, territorial planning, and local coalitions that shape where and how firms build strategic capacity. Research on semiconductor development in the U.S. shows that subnational governments use land, utilities, educational systems, and regulatory flexibility as instruments to attract and anchor advanced chip production. These activities reveal a form of statecraft that is less centralized and that relies on the ability of public authorities to structure incentives, absorb risks, and embed firms within long term institutional arrangements.[52] This perspective shows that economic statecraft extends beyond great power rivalry and emerges from the interaction between multinational companies and the governance systems that organize access to critical resources and productive capabilities.

5. European Silicon Governance

The EU Chips Act, adopted in 2023, set out an ambitious goal for Europe to double its global semiconductor market share from around 10% today to 20% by 2030, aiming to enhance technological sovereignty and reduce dependency on external suppliers.[53] Yet, as global competitors scale up their investments,[54] a report by the European Court of Auditors[55] on the Chips Act shows that this target has proven insufficient to address the depth of Europe's structural vulnerabilities in the semiconductor value chain. With the Chips Act, the EU has mirrored Washington's strategy of reindustrialization, prioritizing capacity-building over economic efficiency. This push for

reindustrialization overlooks a simple reality: the continent currently lacks both the design and fabrication capability to produce state of the art chips at advanced nanometer nodes. Instead of pursuing symbolic industrial targets, investment decisions should be grounded in a realistic assessment of demand within the European market.

Although the EC's claims that over €80 billion in investments have been attracted by the Chips Act so far,[56] recent setbacks, including Intel's cancellation of its €30 billion fabs in Germany,[57] have exposed the EU's overreliance on single projects and underscored the urgent need for the development of a diversified, strategically coordinated semiconductor ecosystem. The principal challenge in coordinating multi-level governance between the central EU-institutions and MS is achieving coherent and efficient policy alignment. The EU Chips Act lacks a coherent long-term strategy, leaving MS to define and develop their own national policies.[58] This fragmentation is further reflected in the Chips Act's financing model, where EU funds depend on national and private contributions, often fueling competition among MS over the scale of state support rather than fostering collective capacity. Translating the Chips Act into industrial output has limited success so far. National legislation and long approval times slow implementation and undermine investor confidence.[59]

The planned mega-fab in France, a joint venture by European STMicroelectronics and American GlobalFoundries and was presented as central pillar under the Chips Act and has received €3 billion in French state aid. Yet because of market uncertainties the project has now stalled. The main issue is that markets move faster than funding mechanisms. This showcases that institutional adaptation currently cannot keep pace with rapid market cycles.[60] Another structural constraint is the not fully integrated internal market: Europe's ambitions, especially but not only in the semiconductor sector, remain constrained by fragmented capital markets and differing legal frameworks that limit cross border investment, venture capital expenditure and economies of scale.[61] Ultimately, the cumulative effect is a policy framework that struggles to convert strategic priority into timely and competitive production capacity, weakening credibility for investment.

The EU has tried to introduce new instruments under the Chips Act to improve oversight and coordination. The European Semiconductor Board monitors progress and facilitates information exchange but has not yet evolved into a task-specific jurisdiction.[62] Adding to this, the Chips Joint Undertaking is a private-public partnership that coordinates funding, governance, and stakeholder engagement to support R&D, innovation, and align priorities across industry and MS.[63]

As Europe advances toward a revised Chips Act 2.0, the Semiconductor Coalition has started to shape proposals to strengthen the semiconductor ecosystem. Its declaration outlines five priorities: steering cross-sector collaboration; aligning public and private funding with faster procurement times for Important Projects of Common European Interest (IPCEI) approvals; investing in talents via a European Chips Skills Programme; advancing industry sustainability through green and circular chip technologies; and deepening international partnerships to secure open and resilient supply chains.[64]

While Europe is often overlooked in global discussions on semiconductors, its position in the upstream segment of the value chain is stronger than commonly perceived. The region hosts leading companies and specialized hubs that underpin chip production worldwide. ASML holds a quasi-monopoly in EUV advanced lithography, securing Europe a pivotal position in the semiconductor value chain. Further, European firms are also global leaders in subsystems and components, providing essential capabilities that sustain chip production worldwide.[65]

Beyond the Netherlands, the continent's industrial strength is distributed across a network of specialized hubs. Germany's Silicon Saxony plays a central role, home to Infineon, one of the world's leading suppliers of power and automotive semiconductors, and Zeiss for optics. TSMC is currently building a joint venture €10 billion fab together with European companies, which is expected to open in

2027. As half of the budget comes through German state subsidies, Europe expects the facility to produce a high output of cutting-edge chips.[66] Further, France and Italy jointly host STMicroelectronics, a global leader in analog, sensor, and embedded solutions.[67] Emerging semiconductor hubs are gaining traction across Europe, with Ireland advancing its Silicon Island initiative, already exporting €13.5 billion in chips,[68] and Poland developing its Tri-City cluster.[69] According to the EC[70], more than €100 billion in policy-driven investment is expected to be mobilized under the Chips Act by 2030.

6. When Two Quarrel, the Third Rejoices?

As this paper discussed, China's accelerating efforts toward self-sufficiency remain constrained by Western control over critical chokepoints. U.S. sanctions against Chinese state-backed enterprises, along with export controls, and technology transfer restrictions, so far have shown only limited success, slowing but not stopping Beijing's progress in cutting-edge chips.[71] The U.S. has extended these export controls to its allies by leveraging its network centrality, restricting European companies' access to the Chinese market and growth opportunities. At the same time, Europe remains dependent on Chinese chips for less advanced technologies, manufacturing, and assembly, highlighting its own vulnerabilities.[72]

Conversely, China's efforts in advanced chipmaking are hampered by limited access to Europe's EUV lithography machines,[73] a dependency which gives the EU a rare point of strategic leverage. Positioned between the accelerating technological confrontation of the U.S. and China, Europe must balance economic openness with the need to safeguard its industrial base and preserve room for independent action.

Amid growing geoeconomic competition, China is increasingly engaged in hybrid operations, acquiring intellectual property through illicit means, including espionage and theft.[74] At the same time, China supports companies through internationally contested subsidies and non-tariff barriers, and restricts market access for foreign firms.[75] Although China will likely retain its developing-country status at the WTO, its choice not to seek further special treatment however signals an effort to bandwagon with the liberal trade order and ease concerns over its state-led model.[76]

For Europe, this generates a complex set of incentives: it reinforces the need to coordinate closely with the U.S., while simultaneously preserving the option to engage pragmatically with China on trade where interests remain convergent. However, the recent Nexperia incident exemplifies the challenges that may arise.[77] The Dutch government's expropriation of the Chinese-owned semiconductor company highlights the dynamics between economics and security, with repercussions for the EU-China relationship. The policy reflects a geoeconomic step for Europe to defend its sovereignty when international rules are undermined. Yet the case also illustrates significant risks, as it has already generated complications in the supply chains[78] and diplomatic tensions.[79] The poor handling of the situation has shown that such crises are best resolved within the EU. These dynamics underline the need for coherent coordination at the EU level to manage similar cases consistently and avoid fragmented national responses.

Against this backdrop, recent foresight work by the EUISS and Institute Montaigne outlines possible scenarios for the future of the European semiconductor sector. The scenario analysis looks at four different ways global rules on technology transfer and export controls might evolve by 2029, and what each would mean for Europe's semiconductor sector. The first scenario assumes a continuation and expansion of unilateral US controls that apply extraterritorially, meaning Washington sets the rules and European companies must follow them to keep access to US technology and markets. The second scenario, called Fortress Europe, imagines that the EU succeeds in creating a unified, EU-wide system for export controls, investment screening, and research cooperation, giving Europe one coherent position instead of 27 fragmented national approaches. The third scenario, CoCom 2.0, envisions a broader multilateral

regime led by the US, Europe, Japan, and other trusted partners, forming a large technology bloc with common rules. The fourth scenario, a US–China bargain, assumes Washington eases restrictions in exchange for economic concessions from Beijing, shifting the balance of market access and influence.

Across these four futures, the main finding is that Europe's interests are best served by the scenario it is least likely to achieve: coordinated EU-level control under Fortress Europe. This would give European companies predictable rules and allow the EU to negotiate with the US from a position of greater coherence. However, participants consider it politically difficult, given the limited appetite among Member States for deeper harmonization. Instead, they view the most likely outcome as the expanding US-led patchwork, which leaves Europe reactive, facing shifting compliance obligations, and more exposed to retaliation from China. A CoCom 2.0 system would provide stability but would sharply reduce access to the Chinese market, which many European firms still depend on, while a U.S.–China bargain would disadvantage Europe even further by redirecting Chinese demand toward US suppliers.[80] Overall, the analysis makes clear that without coordinated EU action, Europe risks ending up in the scenarios least aligned with its economic and technological interests.

Industry experts warn that the EU faces growing dangers under the structural power of U.S.-driven export-control regimes, which could negatively impact the EU's market access, competitiveness, and policy independence. The most likely scenario of U.S. controls envisions Washington expanding its export-restriction regime, coercing European firms to comply even when trading independently. The Fortress Europe framework, where export control decisions are centralized at EU-level, was seen as best protecting European actorness.[81] If the U.S. administration plans for new export controls and tariffs, this could pose serious risks for production networks, constraining R&D, and manufacturing, and increasing operational costs across the value chain.[82]

7. The Way Forward

The challenge for the EU in great power politics is that real power increasingly depends on the ability to coordinate with domestic companies, a capacity that China and the United States already leverage through different forms of state-capitalist models. In an era of geoeconomics, it is no longer possible to keep separate the competencies that matter most. While trade policy remains largely under the EC's authority, foreign policy is the domain of MS. With the switch from geopolitics to geoeconomics, this separation is a structural disadvantage which hinders the Union's ability to coordinate effectively.

Since Mario Draghi[83] published his report on the competitiveness of the EU about a year ago, only about 11% of his recommendations have so far been implemented, lagging in crucial areas such as digitalization and advanced technologies,[84] sectors that are powered by semiconductors. MS need to understand that if they align on a central European level and call for greater collective efforts yet remain unwilling to substantially increase cooperation through an increased Multiannual Financial Framework, they risk undermining the very strategic ambitions they seek to advance. For the semiconductor sector, the EU's fragmented capital system further limits the capacity to raise much needed capital for strategic initiatives.[85]

For the EU, this perspective implies that effective economic statecraft cannot solely rely on high level strategies such as the Chips Act or coordinated export control frameworks. It requires the EU to recognize that strategic influence in the semiconductor sector also emerges from the governance arrangements that exist below the supranational level. Multinational companies respond not only to EU regulations but also to the incentives, infrastructures, and institutional capacities assembled within MS and regional ecosystems. This means that Europe's ability to shape semiconductor production depends on how well single jurisdictions, actors, and stakeholders align with one another and broader geopolitical objectives.

Without coherence between EU institutions, MS, national indus-

trial strategies, and regional development authorities, Europe struggles to convert policy ambition into credible geoeconomic leverage. In practical terms, this insight reinforces the need for stronger coordination across levels of governance, more integrated infrastructure planning, the involvement of industry, and a clearer division of responsibilities that can anchor semiconductor firms more effectively within the European landscape.

As leading experts Miller and Allen[86] note, Europe lacks strength in AI, a key driver of semiconductor growth, and faces Chinese subsidies and export controls. According to the authors, Europe must maintain its technological edge and coordinate with allies to stay competitive. In 2024, generative AI chips made up only 0.2% of global wafer production but were responsible for around 20% revenue.[87] This is a clear signal that the future trend in semiconductors is qualitative. The EU should pursue a gradual transition based on the input and output needs of its key industries. With increased financial investment into critical and emerging technologies, positive spillovers are also likely to have an advantageous effect for the European semiconductor industry.

GlobalFoundries' Jens Drews contends that progress in semiconductor technology should not be judged only by ever smaller process nodes. Instead, he argues that Europe should prioritize three areas. First, it should advance new architectures and energy efficient designs that can compete with the performance of leading-edge chips without requiring extremely small fabrication nodes. Second, it should reduce barriers for young companies by ensuring that startups and small and medium sized enterprises have affordable access to silicon, intellectual property, and design tools. Third, it should concentrate publicly funded production capacity on sectors that are strategically important, such as aerospace, defense, healthcare, and critical infrastructure.[88]

Meanwhile, Trump and Xi have agreed on a pragmatic "deal" to ease tensions through limited recalibrations to Chinese export controls and U.S. tariffs.[89] For the time being, the agreement seems stable. In the medium term, trade disputes between the U.S. and China are likely to continue, exacerbating existing uncertainty for European companies and policymakers. On the long term, the U.S. and Europe must cooperate closely to counteract the pivot of the semiconductor industry to Asia. That said, Europe must learn how to navigate threats from both sides, Chinese and American. According to Emily Benson[90], without European companies there is no global supply chain. According to the expert, European countries and institutions have been too reluctant in showcasing determination and deterrence based on relative strengths. Europe needs to articulate goals, countermeasures and establish mutual assurance arrangements for companies threatened by geoeconomic power politics. The emerging order rewards those who project power through credibility. Europe faces a decisive test of whether it is willing to act accordingly to its interests.

8. Policy Recommendations

Based on the analysis above, the following recommendations are proposed:

Use the Momentum

The ongoing review of the European Chips Act and the launch of the Semiconductor Coalition provide a narrow but decisive window for institutional consolidation. The primary priority must be to shift from symbolism toward implementation driven governance. This requires a reduction of regulatory complexity, faster permitting procedures, and clearer alignment between EU instruments and national industrial frameworks.

At the geopolitical level, the EU must connect semiconductor policy more closely with its emerging AI and geoeconomic security strategies and coordinate closely with private and public stakeholders. Chips production today is increasingly driven by data center demand, advanced computing, and dual-use applications. Without a coordinated demand side strategy, public supply side investments risk structural misalignment with future market dynamics.

Learn From Past Mistakes

Europe needs to redefine the objective of strategic autonomy across the entire semiconductor value chain. As the Japanese case illustrates, resilience is best achieved through selective

indispensability rather than autarky. The EU should concentrate its public investment where it already controls structurally critical functions, notably in advanced lithography, precision optics, power electronics, and specific industrial chips segments for which sustained demand exists among European companies across multiple downstream industries.

In segments where Europe lacks competitive depth, particularly in high volume advanced fabrication and memory production, policy should focus on diversification rather than substitution. As it is almost impossible to replace Asian manufacturing systems, the aim should be to stabilize access through structured partnerships with emerging semiconductor hubs. This approach reduces exposure to bottlenecks and integrates European companies deeper into key geopolitical areas.

Whatever it Takes

In an emerging global order where the rules of free trade apply selectively and are shaped by geoeconomic coercion, the protection of European semiconductor firms has become a matter of vital security rather than commercial preference. The EU must be prepared to use the tools to shield companies from unjustified and politically motivated export controls, coercive market practices, and disruptions of supply chains, intended or unintended.

This requires a more assertive deployment of existing trade defense instruments, including subsidy investigations, the protection of IP, countervailing duties, and retaliation mechanisms. At the same time, European companies need clearer political assurance that compliance under EU institutions is anchored in a common European commitment and enforced on an equal basis across all market participants and MS.

> Europe needs to redefine the objective of strategic autonomy across the entire semiconductor value chain.

In an interconnected global economy, not every linkage can be treated as a vulnerability to be neutralized by economic statecraft. In weaker segments of the value chain, the EU must draw explicit red lines between areas where market exposure is acceptable and areas where intervention is justified on security grounds. Indiscriminate weaponization risks triggering spirals of retaliation that ultimately limit European actorness by blocking access to materials, technologies, and markets. Strategic restraint must be treated as a policy tool in its own right,

Integration and Sovereignty

The growing extraterritorial reach of the U.S. export controls pose a growing threat to the EU's fragmented export control system. A centralized EU level export control assessment mechanism is therefore essential to preserve European middle-power in semiconductor geoeconomics. Such a framework would not only replace national authorities but align strategic decisions with common foreign policy priorities. This would fundamentally strengthen the EU's negotiating position vis a vis Washington and reduce the risk of retaliatory exposure to Chinese countermeasures.

Without consolidation, the EU will remain reactive to initiatives from elsewhere, undermining its capacity to deploy a coherent economic security strategy. Only deeper (financial) integration, the further pooling of strategic competences at the EU level, and a shift toward qualified majority voting in economic security matters can provide the institutional scale required for a credible Europe which can express its sovereignty in the semiconductor domain.

This paper builds on earlier work prepared at the Centre International de Formation Européenne (CIFE) and has been revised and updated for this publication.

About the Author

Samuel Kerschbaumer is a researcher focusing on European economic statecraft, geoeconomics, and security policy. His work examines how international political economy shapes strategic interdependence and the conditions under which it becomes a source of leverage in global affairs. He is affiliated with the EPIS network, has worked with the Austria Institute for European and Security Policy (AIES), and is currently engaged with the Konrad Adenauer Stiftung in Vienna.

[1] Miller, C. (2022). *Chip war: The fight for the world's most critical technology*. Scribner.

[2] Kynge, J. (2025, October 10). *China's new restrictions on rare earth exports send a stark warning to the West*. Chatham House. https://www.chathamhouse.org/2025/10/chinas-new-restrictions-rare-earth-exports-send-stark-warning-west?

[3] Farrell, H., & Newman, A. L. (2019). Weaponized interdependence: How global economic networks shape state coercion. International Security, 44(1), 42–79. https://doi.org/10.1162/isec_a_00351

[4] Farrell, H., & Newman, A. (2025, August 19). The weaponized world economy: Surviving the new age of economic coercion. *Foreign* Affairs. *https*://www.foreignaffairs.com/united-states/weaponized-world-economy-farrell-newman

[5] Varas, A., Varadarajan, R., Goodrich, J., & Yinug, F. (2021, April). Strengthening the global semiconductor supply chain in an uncertain era. Boston Consulting Group & Semiconductor Industry Association. https://www.semiconductors.org/strengthening-the-global-semiconductor-supply-chain-in-an-uncertain-era/

[6] Tomoshige, H., & Crane, B. (2024, January 19). *RAI Explainer: Strategic Importance of Continued U.S. Leadership in Chip Design*. Center for Strategic & International Studies. https://www.csis.org/blogs/perspectives-innovation/rai-explainer-strategic-importance-continued-us-leadership-chip

[7] Gordon, P. H., & Haas, R. (2025, September 22). *Nobody Lost Taiwan: The island remains secure and stable—for now*. Foreign Affairs. https://www.foreignaffairs.com/taiwan/nobody-lost-taiwan

[8] Gehrke, T., & Oertel, J. (2025, October 21). *Escalate to negotiate: How Europe should respond to Chinese export restrictions*. European Council on Foreign Relations. https://ecfr.eu/article/escalate-to-negotiate-how-europe-should-respond-to-chinese-export-restrictions/

[9] Baskaran, G. (2025, October 9). *China's new rare earth and magnet restrictions threaten U.S. defense supply chains*. CSIS. https://www.csis.org/analysis/chinas-new-rare-earth-and-magnet-restrictions-threaten-us-defense-supply-chains

[10] Bauer, M., & Pandya, D. (2024). *Time to rethink export controls for strengthened US-EU cooperation and global trade rules (Policy Brief No. 07/2024)*. European Centre for International Political Economy. https://ecipe.org/wp-content/uploads/2024/04/ECI_24_PolicyBrief_07-2024_LY03.pdf

[11] Varas, A., Varadarajan, R., Goodrich, J., & Yinug, F. (2021, April). Strengthening the global semiconductor supply chain in an uncertain era. Boston Consulting Group & Semiconductor Industry Association. https://www.semiconductors.org/strengthening-the-global-semiconductor-supply-chain-in-an-uncertain-era/

[12] Hamdani, M., & Belfencha, I. (2024). Strategic implications of the US–China semiconductor rivalry. Discover Global Society, 2(1), Article 67. https://doi.org/10.1007/s44282-024-00081-5

[13] García-Herrero, A., & Weil, P. (2022). *Lessons for Europe from China's quest for semiconductor self-reliance* (Policy Contribution No. 19/2022). Bruegel. https://www.bruegel.org/system/files/2022-11/PC%2019%202022_0.pdf

[14] European Commission. (2025, September 29). *Semicon Coalition calls for a reinforced Chips Act*. Digital Strategy. https://digital-strategy.ec.europa.eu/en/news/semicon-coalition-calls-reinforced-chips-act

[15] European Commission. (2025, September 5). *Commission launches public consultation and call for evidence on the evaluation and review of the Chips Act*. Retrieved October 20, 2025, from https://digital-strategy.ec.europa.eu/en/news/commission-launches-public-consultation-and-call-evidence-evaluation-and-review-chips-act

[16] European Commission. (2025). *European Chips Act*. Shaping Europe's Digital Future. Retrieved October 20, 2025, from https://digital-strategy.ec.europa.eu/en/policies/european-chips-act

[17] Blackwill, R. D., & Harris, J. (2016). War by Other Means : Geoeconomics and Statecraft. Harvard University Press.

[18] Shrivastava, M., & Jash, A. (2025). *China's semiconductor conundrum: Understanding US export controls and their efficacy. Cogent Social Sciences, 11*(1), Article 2528450. https://doi.org/10.1080/23311886.2025.2528450

[19] Fuller, D. B. (2025). Technology and economic statecraft: Weaponizing technology export controls in an era of globalized production. In V. K. Aggarwal & T. M. Cheung (Eds.), The Oxford handbook of geoeconomics and economic statecraft (pp. 201–218). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780197673546.013.14

[20] Shrivastava, M., & Jash, A. (2025). *China's semiconductor conundrum: Understanding US export controls and their efficacy. Cogent Social Sciences, 11*(1), Article 2528450. https://doi.org/10.1080/23311886.2025.2528450

[21] Bonnet, P., Ciani, A., Molnar, J., & Nardo, M. (2025). *EU's strengths and weaknesses in the global semiconductor sector* (JRC141323). Publications Office of the European Union. https://doi.org/10.2760/6302476

[22] Calcara, A., Teer, J., & Zaccagnini, I. (2025). The technological underpinnings of European autonomy and US-China competition. *Journal of European Integration*, *47*(6), 943-963. https://doi.org/10.1080/07036337.2025.2536828

[23] Bieling, H.-J. (2022). Die Europäische Union im Zeitalter der »neuen Geopolitik«. Das Argument, 64(338), 411–426.

[24] von der Leyen, U. (2025, March 20). *Speech by the President at the European Parliament Plenary debate on the conclusions of the European Council meeting of 20 March 2025*. European Commission. Retrieved from https://ec.europa.eu/commission/presscorner/detail/et/speech_25_938

[25] von der Leyen, U. (2025, September 10). *2025 State of the Union Address*. European Commission. https://ec.europa.eu/commission/presscorner/detail/en/speech_25_2053

[26] Kroll, H. (2024). Assessing open strategic autonomy. Publications Office of the European Union. https://doi.org/10.2760/767279

[27] European Commission, & High Representative of the Union for Foreign Affairs and Security Policy. (2023, June 20). Joint Communication to the European Parliament, the European Council and the Council on "European Economic Security

Strategy" (JOIN(2023) 20 final). Publications Office of the European Union. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52023JC0020

[28] Höra, E., & Weiss, S. (2025). The EU's geoeconomic toolkit: Building resilience in an era of global rivalry. In K. H. Fischer (Ed.), European security put to the test: Volume III — The quest of geopolitics for truth and resilience (pp. 421–450). Nomos Verlag.

[29] Berg, O., Wienke, T.-M., Kelliher, K., Sensenig, T., & Roussier, L. (2025, March 27). *Foreign direct investment reviews 2025: European Union*. White & Case LLP. https://www.whitecase.com/insight-our-thinking/foreign-direct-investment-reviews-2025-european-union

[30] Council of the European Union. (2025, October 23). *EU sanctions against Russia*. https://www.consilium.europa.eu/en/policies/sanctions-against-russia/

[31] Gehrke, T., & Medunic, F. (2024, June 27). *Fortune favours the bold: Upgrading the EU's geoeconomic strategy*. European Council on Foreign Relations. https://ecfr.eu/publication/fortune-favours-the-bold-upgrading-the-eus-geoeconomic-strategy/

[32] Flórez Mendoza, J., Reiter, O., & Stehrer, R. (2024, November). *Impacts of the EU carbon border adjustment mechanism* (Policy Notes & Reports No. 86). Vienna Institute for International Economic Studies (wiiw). https://wiiw.ac.at/impacts-of-the-eu-carbon-border-adjustment-mechanism-dlp-7075.pdf

[33] Duthoit, A., & Lemerle, M. (2022, September 13). Missing chips cost EUR 100 bn to the European auto sector. Allianz Research / Allianz Trade. https://www.allianz-trade.com/content/dam/onemarketing/aztrade/allianz-trade_com/en_gl/erd/publications/the-watch/2022_09_13_European-Auto.pdf

[34] Chen, L. S., & Evers, M. M. (2023). *"Wars without gun smoke": Global supply chains, power transitions, and economic statecraft. International Security, 48*(2), 164–204. https://doi.org/10.1162/isec_a_00473

[35] Kusters, J., Bhattacharjee, D., Bish, J., Nicholas, J. T., Stewart, D., & Ramachandran, K. (2025, February 4). *2025 global semiconductor industry outlook.* Deloitte Center for Technology, Media & Telecommunications, Deloitte. https://www.deloitte.com/us/en/insights/industry/technology/technology-media-telecom-outlooks/semiconductor-industry-outlook.html

[36] International Business Strategies, Inc. (2025). CAPEX activities in semiconductor industry for support of growth. International Business Strategies, Inc. https://www.semi.org/sites/semi.org/files/2025-05/MS-SEMIWEB5.2825.pdf

[37] German Institute for Security and International Studies. 2025. *GI25 Executive Briefing – The Semiconductor Ecosystem and Export Controls*. GSIS Hamburg. August 21. https://www.gsis-hamburg.com/fileadmin/gsis/2025/pdf/gi25_executive_briefing_20250821_archive.pdf

[38] Kennedy, M., Fingar, C., Parameswaran, P., & Larres, K. (2025, April 1). *360° View of How Southeast Asia Can Attract More FDI in Chips and AI*. Wilson Center. https://www.wilsoncenter.org/article/360deg-view-how-southeast-asia-can-attract-more-fdi-chips-and-ai

[39] Bhandari, K. (2025, August 25). *India's Semiconductor Mission: The Story So Far*. Carnegie Endowment for International Peace. https://carnegieendowment.org/research/2025/08/indias-semiconductor-mission-the-story-so-far

[40] Gonzalez Henrichsen, J. (2024, February 14). *The future of semiconductor chip manufacturing: North America's opportunity with Mexico*. Forbes Business Council. https://www.forbes.com/councils/forbesbusinesscouncil/2024/02/14/the-future-of-semiconductor-chip-manufacturing-north-americas-opportunity-with-mexico/

[41] Yang, H., Jin, H., & Sterling, T. (2024, October 18). *Exclusive: Samsung delays taking deliveries of ASML chip gear for its new US factory, sources say.* Reuters. https://www.reuters.com/technology/samsung-delays-taking-deliveries-asmls-chip-gear-its-new-us-factory-sources-say-2024-10-18/

[42] Rodgers, L., Clark, D., Joiner, S., Haslett, B., de la Torre Arenas, I., & Learner, S. (2024, February 28). *Inside the miracle of modern chip manufacturing* [Interactive graphic]. *Financial Times*. https://ig.ft.com/microchips/

[43] Tarasov, K. (2025, May 22). *Exclusive look at High NA: ASML's new $400 million chip-making colossus*. CNBC. https://www.cnbc.com/2025/05/22/exclusive-look-at-high-na-asmls-new-400-million-chipmaking-colossus.html

[44] Sacks, D., & Segal, A. (2025, March 4). *Unpacking TSMC's $100 billion investment in the United States* [Blog post]. Council on Foreign Relations. https://www.cfr.org/blog/unpacking-tsmcs-100-billion-investment-united-states

[45] Thomas, P. A. (2025, January 21). Delays in TSMC's Arizona plant spark supply chain worries. *CIO.* https://www.cio.com/article/3806430/delays-in-tsmcs-arizona-plant-spark-supply-chain-worries.html

[46] Wiseman, B., Marcil, H., de Jong, M., Wagner, R., Roundtree, T., & Stopford, T. (2025, April 21). *Semiconductors have a big opportunity—but barriers to scale remain*. McKinsey & Company. https://www.mckinsey.com/industries/semiconductors/our-insights/semiconductors-have-a-big-opportunity-but-barriers-to-scale-remain

[47] Kim, W., & Rho, S. (2024). The US–China chip war, economy–security nexus, and Asia. International Politics, 61, 1130–1152. https://doi.org/10.1007/s11366-024-09881-7

[48] Kim, W., & Rho, S. (2024). The US–China chip war, economy–security nexus, and Asia. International Politics, 61, 1130–1152. https://doi.org/10.1007/s11366-024-09881-7

[49] Kleinhans, J.-P. (2024, July 30). *The missing strategy in Europe's chip ambitions: Member states must drive the next steps*. Interface. https://www.interface-eu.org/publications/europe-semiconductor-strategy

[50] Capistrano, A. (2025, March 3). *Japan is no island when it comes to semiconductors. Rightly so.* The Japan Times. https://www.japantimes.co.jp/commentary/2025/03/03/japan/japan-international-semiconductor-strategy/

[51] Cai, Y., & Maquieira-Alonzo, J. (2025). The Business Security Dilemma: Responses to the US weaponization of semiconductors. Asian Review of Political Economy, 4(9). https://doi.org/10.1007/s44216-025-00051-x

[52] Kollar, J. (2025). Techno-statecraft and industrial strategy: semiconductor development in Arizona. Contemporary Social Science, 1–20. https://doi.org/10.1080/21582041.2025.2565226

[53] European Commission. (2023, September 21). *European Chips Act*. https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-chips-act_en

[54] Chang, Y.-H. (2025, June 25). *Strategic Silicon: Geopolitics is redirecting semiconductor investment*. IDTechEx. https://www.idtechex.com/en/research-article/strategic-silicon-geopolitics-is-redirecting-semiconductor-investment/33412

[55] European Court of Auditors. (2025). *Special report 12/2025: The EU's strategy for microchips — Reasonable progress in its implementation, but the Chips Act is very unlikely to be sufficient to reach the overly ambitious Digital Decade target.* Publications Office of the European Union. https://www.eca.europa.eu/en/publications/SR-2025-12

[56] European Commission. (2025, April 28). *European Chips Act – Update on the latest milestones*. Retrieved October 20, 2025, from https://digital-strategy.ec.europa.eu/en/news/european-chips-act-update-latest-milestones

[57] Alvares de Souza Soares, P. (2025, July 25). *Intel meldet Milliardenverlust und gibt Pläne für Fabrik in Magdeburg auf. Handelsblatt.* https://www.handelsblatt.com/technik/it-internet/halbleiter-intel-meldet-milliardenverlust-und-gibt-plaene-fuer-fabrik-in-magdeburg-auf/100143961.html

[58] Kleinhans, J.-P. (2024, July 30). *The missing strategy in Europe's chip ambitions: Member states must drive the next steps*. Interface. https://www.interface-eu.org/publications/europe-semiconductor-strategy

[59] Malaponti, C. (2025, April 30). *Chips on the menu: How the EU can get its act together on semiconductors.* European Council on Foreign Relations. https://ecfr.eu/article/chips-on-the-menu-how-the-eu-can-get-its-act-together-on-semiconductors/

[60] Brans, P. (2025). Europe's Chips Act stumbles over its own rigidity. EE Times Europe, 8(4), 9–11. https://www.eetimes.eu/ee-times-europe-magazine-november-2025/

[61] Fratto, C., Gatti, M., Kivernyk, A., Sinnott, E., & van der Wielen, W. (2024). *The scale-up gap: Financial market constraints holding back innovative firms in the European Union*. European Investment Bank. https://doi.org/10.2867/382579

[62] European Commission. (2025, March 28). *European Chips Act: Monitoring and crisis response*. Retrieved October 12, 2025, from https://digital-strategy.ec.europa.eu/en/factpages/european-chips-act-monitoring-and-crisis-response

[63] European Union. (n.d.). *Chips Joint Undertaking*. Retrieved October 10, 2025, from https://european-union.europa.eu/institutions-law-budget/institutions-and-bodies/search-all-eu-institutions-and-bodies/chips-joint-undertaking_en

[64] European Commission. (2025, September 29). *Semicon Coalition calls for a reinforced Chips Act*. Digital Strategy. https://digital-strategy.ec.europa.eu/en/news/semicon-coalition-calls-reinforced-chips-act

[65] West, J., & Eloy, J.-C. (2024, April 18). *Underappreciated EU suppliers lead the semiconductor equipment market*. Yole Group. Retrieved from https://www.yolegroup.com/strategy-insights/underappreciated-eu-suppliers-lead-the-semiconductor-equipment-market/

[66] Tobin, M., & Wu, X. (2025, November 19). Europe's chip dreams confront business realities. The New York Times. https://www.nytimes.com/2025/11/19/technology/europe-tsmc-chips.html

[67] industriAll European Trade Union. (2024, April 3). *The semiconductor industry in Europe: Between geopolitics and tech race* [Policy brief]. industriAll Europe. https://www.industriall-europe.eu/documents/upload/2024/5/638503252902676944_semi_conductors_Draft_policy_brief_-_common_part_(002).pdf

[68] Government of Ireland, Department of Enterprise, Trade and Employment. (2025, May 19). *Silicon Island: Ireland's national semiconductor strategy* [Policy Papers/Strategies, Reports]. https://enterprise.gov.ie/en/publications/silicon-island-a-national-semiconductor-strategy.html

[69] Ministry of Economic Development and Technology of Poland. (2024, November 22). *Semiconductors in the Tri-City – A new investment by MEP Solutions*. Trade.gov.pl. https://www.trade.gov.pl/en/news/semiconductors-in-the-tri-city-a-new-investment-by-mep-solutions/

[70] European Commission. (2024, July 24). *Chips Act*. Shaping Europe's digital future. https://digital-strategy.ec.europa.eu/en/factpages/chips-act

[71] Shivakumar, S., Wessner, C., & Howell, T. (2025, April 14). *The limits of chip export controls in meeting the China challenge*. Center for Strategic and International Studies. https://www.csis.org/analysis/limits-chip-export-controls-meeting-china-challenge

[72] Rühlig, T. N. (2024, December 13). *Curbing China's legacy chip clout: Reevaluating EU strategy* (Brief No. 21). European Union Institute for Security Studies. https://www.iss.europa.eu/publications/briefs/curbing-chinas-legacy-chip-clout-reevaluating-eu-strategy

[73] Kusters, J., Bhattacharjee, D., Bish, J., Nicholas, J. T., Stewart, D., & Ramachandran, K. (2025, February 4). *2025 global semiconductor industry outlook.* Deloitte Center for Technology, Media & Telecommunications, Deloitte. https://www.deloitte.com/us/en/insights/industry/technology/technology-media-telecom-outlooks/semiconductor-industry-outlook.html

[74] Lewis, J. A. (2023, November 17). *Rethinking technology transfer policy toward China*. Center for Strategic and International Studies. https://www.csis.org/analysis/rethinking-technology-transfer-policy-toward-china

[75] Boullenois, C., Kratz, A., & Rosen, D. H. (2025, March 17). *Far from normal: An augmented assessment of China's state support*. Rhodium Group. https://rhg.com/wp-content/uploads/2025/03/Far-From-Normal-An-Augmented-Assessment-of-Chinas-State-Support.pdf

[76] Xu, X. (2025, October 1). *China's status as a developing country remains unchanged*. Global Times. https://www.globaltimes.cn/page/202510/1344865.shtml

[77] Fleming, S., Schipani, A., & Williams, A. (2025, October 14). *Dutch seizure of chipmaker followed US ultimatum over Chinese chief*. *Financial Times*. https://www.ft.com/content/db019842-01a9-4488-a6a0-45d0e102536b

[78] Tewari, S. (2025, November 11). *Battle over Chinese chip maker rocks global car industry*. BBC News. https://www.bbc.com/news/articles/cr43kyn9d6po

[79] Jagtiani, S. L. (2025, November 13). *The Nexperia wake-up call: Can Europe secure its tech future amid China-US rivalry?*The Diplomat. https://thediplomat.com/2025/11/the-nexperia-wake-up-call-can-europe-secure-its-tech-future-amid-china-us-rivalry/

[80] Teer, J. (2025). Semiconductors: European views on four 2029 tech-transfer regime scenarios (Policy Paper No. 37). EU

Institute for Security Studies; Chips Diplomacy Support Initiative. https://institutmontaigne.org/ressources/pdfs/publications/policy-paper-semiconductors-european-views-on-four-2029-tech-transfer-regime-scenarios.pdf

[81] Teer, J. (2025). *Semiconductors: European views on four 2029 tech transfer regime scenarios* (CHIPDIPLO Policy Paper No. 1). European Union Institute for Security Studies & Institut Montaigne. https://institutmontaigne.org/ressources/pdfs/publications/policy-paper-semiconductors-european-views-on-four-2029-tech-transfer-regime-scenarios.pdf

[82] Kusters, J., Bhattacharjee, D., Bish, J., Nicholas, J. T., Stewart, D., & Ramachandran, K. (2025, February 4). *2025 global semiconductor industry outlook.* Deloitte Center for Technology, Media & Telecommunications, Deloitte. https://www.deloitte.com/us/en/insights/industry/technology/technology-media-telecom-outlooks/semiconductor-industry-outlook.html

[83] European Commission. (2024). *The Draghi report on the future of European competitiveness*. https://commission.europa.eu/topics/eu-competitiveness/draghi-report_en

[84] European Policy Innovation Council (EPIC). (2025, September 2). *Draghi Observatory & Implementation Index: Only 1 in 10 measures implemented*. EPIC. https://thinkepic.eu/draghi-observatory-implementation-index-only-1-in-10-measures-implemented/

[85] Lindner, J., & Mack, S. (2024, July 11). *Capital Markets Union: Europe must stop beating around the bush* [Policy brief]. Jacques Delors Centre.https://www.delorscentre.eu/en/publications/detail/publication/capital-markets-union

[86] Miller, C., & Allen, J. (2025, October 16). *Europe Is Losing the Chips Race*. *Foreign Affairs*. https://www.foreignaffairs.com/europe/europe-losing-chips-race

[87] Deloitte. (2025, February 4). *2025 global semiconductor industry outlook*. Deloitte Insights. https://www.deloitte.com/us/en/insights/industry/technology/technology-media-telecom-outlooks/semiconductor-industry-outlook.html

[88] Brans, P. (2025). Intel's retreat shifts Europe's semiconductor reality. EE Times Europe, 8(4), 16–19. https://www.eetimes.eu/ee-times-europe-magazine-november-2025/

[89] The White House. (2025, November 1). *President Donald J. Trump strikes deal on economic and trade relations with China* [Fact sheet]. https://www.whitehouse.gov/fact-sheets/2025/11/fact-sheet-president-donald-j-trump-strikes-deal-on-economic-and-trade-relations-with-china/

[90] Institut Montaigne. (2025, October 27). *Three questions for Emily Benson: Inside the conflicting signals of US export-control strategy*. https://www.institutmontaigne.org/en/expressions/three-questions-emily-benson-inside-conflicting-signals-us-export-control-strategy

© Austria Institut für Europa und Sicherheitspolitik, 2026

All rights reserved. Reprinting or similar or comparable use of publications of the Austria Institute for European and Security Policy (AIES) are only permitted with prior permission. The articles published in the AIES Focus series exclusively reflect the opinions of the respective authors.

Dr. Langweg 3, 2410 Hainburg/Donau

Tel. +43 (1) 3583080

office@aies.at | www.aies.at