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Semiconductor and ICT Industrial Policy in the US and EU: Geopolitical Threat Responses

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Abstract

This article analyses chips and critical ICT infrastructure policy in the US and the EU. It examines the increasing importance of Waltian geopolitical security threats on both sides of the Atlantic as a driver of industrial policy, export controls, self-sufficiency, and friendshoring as a replacement for dependence on global supply chains. It shows that threat perceptions are strong and bipartisan in the US, allowing comprehensive, strategic and well-funded industrial policy. Threat perceptions driving chip and 5G industrial policy are also present in the EU's Economic Security Strategy and related policies. However, differing national preferences dilute a Waltian turn with continued attachment to liberal (global supply chain) approaches to chips and 5G infrastructure and a Waltian realist stance (capacity-building to build, protect, and promote regardless of security threat) that occupies the middle ground.

Keywords

5G; European Union; industrial policy; national security; semiconductors; strategic autonomy; supply chains; United States

Issue

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1. Introduction

How have government attitudes toward involvement in chip manufacturing and 5G development changed in response to recent pressures on supply chains and concerns about their reliability? Since 2022, Western states have become increasingly concerned about ensuring a secure supply of physical infrastructure in semiconductors, telecommunications equipment, and ICT-capable devices. In some cases, supply chains have been disrupted by the Covid-19 pandemic. In others, governments have been increasingly concerned about geopolitical disruptions and the potential for malicious exploitation of vulnerabilities in internet communications on which their economies, governments, and societies increasingly rely. This includes technology transfer through inward foreign direct investment and technology exports to countries beyond the circle of allies. Particular attention in these areas is reserved

for China, given several concerns about the increasing potential for political and geopolitical confrontation, the disruption to chip production that could follow from a Chinese attack on Taiwan, and the role that these technologies could play in a future conflict. In this context, this article seeks to parse out the drivers behind state-led ICT strategies in Europe and the US and extrapolate current trends into options and likely trajectories for the near future. It contrasts the relative strength of motivations for self-sufficiency (general capacity-building), security (development to meet a threat), and economy (building infrastructure without concern for self-sufficiency). It also touches on 5G infrastructure development through the same lenses and compares these developments with realist and liberal international relations theories. It also illuminates the impact of institutional power on the relative capacity of EU and US officials to translate geopolitical concerns into concrete action.

2. Realism, Liberalism, and State Behaviour in Chip and 5G Development

To study the degree and motivations for change in state behaviour toward chip and ICT infrastructure, it can be useful to think of a spectrum of responses between realism and liberalism, with full autonomy and self-sufficiency on one end of the spectrum and a *laissez-faire* attitude on the other. The liberal end of the spectrum reflects the dominant attitude of European and American governments prior to the Trump administration in the US (2017–2021) and the Van der Leyen Commission in the EU toward the development, production, and use of chips and 5G network infrastructure. The EU and US had allowed global supply chains to develop in chips and ICT infrastructure in the pursuit of cost efficiency, economic interdependence, and friendly political relations. Companies shifted production abroad, concentrated it in Taiwan and Korea, and incorporated China into the assembly process. Chips and ICT infrastructure could be purchased at the lowest price and rolled out regardless of provider, and geopolitical conflict would be contained by states seeking to preserve the welfare gains provided by interdependence. Norms and values could be calibrated by specific tools and agreements in the pursuit of “managed globalization” (Meunier, 2007).

The realist end of the spectrum in contrast stresses self-sufficiency in critical resources, technologies, and infrastructure to ensure survival through strength and self-reliance, adapting to changing conditions, including the relative advances of other countries where required to secure a favourable balance of power. The most extreme form of this drive is entirely self-sufficient: pursued through a country’s independent capacity (internal balancing) or trade wars and other attempts to drag any potential rival down in relative power (mercantilism). It can also be pursued collectively by distinguishing friends from foes and bundling capacity with allies (external balancing through *friendshoring*). Realist motivations can be seen in efforts to develop hardware and manufacturing, as well as software like artificial intelligence as core components of economic power. It can also be seen when the state restricts economic activity across borders due to their implications for international power.

Within the realist paradigm, theorists distinguish two takes on when states do this. Waltzian realist thought (Waltz, 1979) expects states to engage in automatic balancing: continuously seeking self-sufficiency in national economic capacity and technical prowess to protect and promote their position in the international system. In contrast, Waltian realists (Walt, 1990) expect balancing primarily in response to a perceived concrete threat that turns a lack of resources or dependence on others into a source of weakness and insecurity. Attention to security and independence ebbs during periods of decreased security concerns but returns when confronted with a real or perceived threat, leading states

to fear for their status in the international system, or their ability to resist coercion from other states.

There is a growing literature on realist balancing, portrayed as geopolitical turns in foreign (economic) policies of the EU and the US (Di Carlo & Schmitz, 2023; Meunier & Nicolaidis, 2019; Schmitz & Seidl, 2022) since 2015–2016. We can see Waltzian attention to the relative balance of power in the EU’s desire to build Strategic Autonomy for its own sake, and the Trump administration’s efforts to undercut China’s economic growth and enhance American exports. More recent policy in the US and EU reflects security threats, particularly Russia (since the 2014 invasion of Crimea), and China (regarding threats against Taiwan, its stance toward Taiwan’s supporters in the West, and the Chinese wave of foreign investment into Europe buying tech companies generating military or dual-use goods and services; Genschel & Schimmelfennig, 2022). The Biden administration’s emphasis on the threat from China (Walt, 2021) sets it apart from the more generalised hostility of the Trump administration toward China on geo-economic grounds while downplaying China’s great power ambitions in its region.

The realist concern for state capacity to provide for security is also reflected in extant literature tracing the impact of security threats. Kelemen and McNamara (2022) show the EU developing institutionally to better respond to real and perceived threats to its existence. State intervention related to security and survival is also studied in new literature on the regulatory security state (Levi-Faur, 2023), which justifies and exercises the use of regulatory power to shape the behaviour of companies and governments with narratives of providing public safety and international security. Particularly useful for the discussion regarding chips and 5G infrastructure is the distinction between two versions of the security state: the positive security state (which produces security goods) and the regulatory security state, which produces them by rules. These developments in turn rest on ideas and meanings underpinning a focus on security and the implications thereof as much as interests and institutions of policy development (Kruck & Weiss, 2023). In between these two ideal types, we can think also of industrial policy measures in which the state prompts the production of security goods with subsidies. It is not the intent to use these analytical categories as mutually exclusive, but potentially complementary. Subsidies, production, and rules surrounding trade, or the source of company and fixed capital investments relate to one another by stimulating and shaping production in the private sector as much as in public goods provision (Donnelly, 2023a; McNamara, 2023).

Despite similarities between the US and Europe, the geopolitical turn happened earlier and more strongly in the US than in Europe. This article argues that this is primarily a result of different political attitudes. In the 2020 American general election, both political parties adopted realist, anti-China tech trade and investment policies that permitted a hard, threat-based realist foreign economic

policy. In Europe, the Commission needed to balance its newfound realist worldview against more liberal preferences of its most powerful member state and a policy legacy of open trade promotion.

This article conducts a congruence analysis between the theoretical approaches outlined above and the behaviour of the US and EU institutions, as well as France and Germany from 2019 to the present. It examines investment in independent hardware manufacturing as an alternative to dependence on foreign suppliers, state backing of companies and state protection of national companies from foreign takeover where new capacity is located. The article looks at whether governments seek self-sufficiency (internal balancing), selective interdependence with allies (friendshoring, external balancing), or continued reliance on global supply chains (liberalism). France and Germany are major technological and foreign policy players in Europe, which makes them interesting parts of the European case study. But they also have distinct stances that influence what the Commission chooses to do.

The time period incorporates the pre-Covid-19 status quo and allows us to contrast that with the evolution of EU, French, and German policies and initiatives. This will simultaneously allow us to parse out different possible motivations, including the supply chain bottlenecks introduced by Covid-19, concerns about China's combination of technological advancement and political/military hostility towards allies (Taiwan), the rules-based international order (South China Sea disputes) and the West in general (support for Russia's war against Ukraine), and, finally, US positions and policy actions as a friendly power whose actions nevertheless may have negative externalities for the EU and its member states unless coordinated (Chips and Science Act shutting out EU actors, compelling brain drain and R&D loss). While this could be framed by EU actors as poaching, it might also be considered an impetus for the EU and member states to follow suit.

3. The American Context

The American approach to semiconductors prior to the Trump administration was one of liberal interdependence and global supply chains, resulting in a transfer of manufacturing from the US to East Asia in the late 20th and early 21st centuries. The Trump administration imposed Section 301 tariffs in 2018 amounting to 25% on a number of imports citing national security reasons, including Chinese semiconductors. Despite the national security claim, these tariffs addressed economic complaints against dumping subsidised goods. It then followed in 2019 with export restrictions on chips destined for Chinese telecoms giant Huawei, which exported smartphones and 5G telecoms equipment. This time national security concerns about spyware access were articulated (Bown, 2020), as is shown in its attacks on the Chinese social media app TikTok. By 2020, the Trump

administration had convinced Taiwanese chip manufacturer TSMC to plan a plant in Arizona, and the National Defence Authorization Act had been passed to boost chip manufacturing (Bown, 2020).

American pressure on European countries and the EU itself focused on concerns that Huawei 5G infrastructure, while cheaper and highly advanced, would leave companies, governments, and individuals exposed to surveillance, industrial espionage, and cyberattacks backed and/or demanded by the Chinese state. These concerns were articulated by both the Trump and Biden administrations. They considered Chinese 5G infrastructure in Europe both a security risk and a concern for those within the American intelligence community that sharing information with allies came with a risk of unwanted surveillance by non-allies. This generated tensions with Europe, which Friis and Lysne (2021) show accepted only partially the White House's security concerns about China. Neither the US nor China linked semiconductors to any specific military threat, however.

Under the Biden administration, strong bipartisan support, including a Senate supermajority of 60% of votes required to pass legislation, existed on identifying China as a national security threat, and semiconductors as a key strategic asset, despite the ubiquitous polarisation of party politics. The administration retained and strengthened the anti-China policies and Section 301 trade tools of its predecessor in its election campaigning and its domestic economic policies. These sought to rebuild manufacturing and infrastructure in a wide variety of sectors, including semiconductors. Rare bipartisan agreement in an otherwise polarised environment can be seen in the Chips and Science Act of 2022, which intended to restore industrial manufacturing, as well as research and development in the chips sector, from design to packaging, creating self-sufficiency for the American economy. The proposal was made on July 1, 2021, and approved on August 9, 2022. It was considered both a reaction to the supply chain vulnerabilities of the corona years, as well as a response to a decline in the US share of global semiconductor production, and a strategic national security imperative to ensure technical supremacy vis-à-vis China (Donnelly, 2023a; Wang & Sotomayor, 2022).

The industrial policy investments made by the Chips and Science Act were significant. Congress shaped the Chips and Science Act to make investments in a wide variety of initiatives with a total budget of 280 billion dollars, with 54 billion earmarked for semiconductors. The building of manufacturing and packaging facilities would be supported through the Department of Commerce with 39 billion dollars, and research and development (also through the Department of Commerce) with 11 billion, including a National Semiconductor Technology Center, a National Advanced Packaging Manufacturing Program, a Manufacturing USA Semiconductor Institute to promote public-private coordination, and a Microelectronics Metrology programme at the National Institutes of Standards and Technology. Two billion was reserved

for the Department of Defence for coordination and information-sharing. In addition to the money allocated through the Chips and Science Act, a manufacturing investment tax credit was designed and passed to compensate American businesses for price differentials between American and offshore chip manufacturing derived from foreign subsidies. In all these cases, recipients would be banned from producing in countries “that present a national security concern, including the People’s Republic of China” (Van Hollen, 2022). Investments soon followed in a number of states (Whalen, 2022a, 2022b).

The national security facet of American chip policy became even more prominent in October 2022 as concern rose that China might use the US’s commitment of resources in Ukraine to mount an invasion of Taiwan, cutting the US and the rest of the West off from chips for both military and civilian purposes. In this environment, an executive order on export controls not only banned the export or development of highly advanced chips to China by US companies and nationals but also lower-tech chips. Whereas exports of older chips were previously permitted once a new generation of processors had come out, they would now be restricted more comprehensively in order to suppress China’s semiconductor and computing capacity. Restrictions on US companies were further enhanced by US agreements with Dutch and Japanese companies in March 2023 to introduce export controls for the most advanced chips and production equipment (Bounds et al., 2023; Liu et al., 2022; Nellis et al., 2022). In August 2023, a White House executive order made even more explicit that export controls were designed to shape the balance of capabilities in artificial intelligence, cryptography, surveillance, advanced weapons systems, and quantum computing (The White House, 2023).

This support relied not only on the shared support for re-industrialisation and the spread of high-quality jobs throughout key parts of the US (particularly battleground states of Ohio and Arizona) but also the shared view of Democrats and Republicans that China formed an imminent threat to US national security that justified an American industrial policy plan to produce critical infrastructure, including chips, at home (Sevastopulo, 2023; The White House, 2022). Overall, these observations demonstrate a Waltian turn in the US, pursuing self-sufficiency and technological leadership in response to threats, making the US a leader in semiconductor manufacturing and less dependent on other countries in the supply chain. The broad agreement on both these points subsequently shaped how the EU and its member states approached the question of whether and how to subsidise chips and ICT infrastructure in the interests of national security.

4. The European Case

The EU began the realist turn in semiconductor and 5G policy much later than the US, following a liberal mar-

ket approach until 2019, and introducing concrete initiatives in 2022, after the US had passed its own initial measures. The first European Commission interest in industrial policy in chips can be found in 2013 when it permitted EU, national, and regional state aid to attract private investments in chip research, development, and industry within a broader pro-market strategy (European Commission, 2013). However, the Digital Single Market (DSM) of 2015 that followed was indiscriminate about where ICT infrastructure and hardware were sourced, as long as it was installed and used. The DSM envisaged companies and consumers using that infrastructure to support online commerce (retail, wholesale, and financial) in products, services, and companies seen as sunrise industries connected to the Fourth Industrial Revolution, and a data-driven economy that could start to compete with American digital giants. The Commission also sought to extend existing regulations to the digital realm (consumer protection, contract law, competition policy), introduce new regulations (privacy and illegal content law), and promote further investment by companies and national governments in 5G+ communication, satellite support, and datacentre infrastructure quickly and extensively.

This DSM’s liberal emphasis discounted arguments from the EU security community that investment in independent production capacity, infrastructure, and R&D was urgent and beneficial, given the dual civil and military uses of most technologies. The European Union Institute for Security Studies argued in 2009 that technology transfers from the EU to China should be viewed through the lens of connections between technology, economic power, and security (Stumbaum, 2009). Council calls for a focus on domestic technological prowess came in 2013 (with a European Defence Technological and Industrial Base) but had to be repeated in 2015. The Commission approved a 2018 joint research and development initiative by France, Germany, Italy, and the UK for microelectronics by allowing state aid (European Commission, 2018). However, efforts to promote chip development remained related to general economic and technological capacity.

Geopolitical concerns gained traction in the EU in 2018 in response to a trade war with the US, and growing concerns about inward investment from China through which European companies could lose and transfer critical technology and hardware (Meunier & Nicolaidis, 2019). EU member states experiencing high concentrations of Chinese investment in these sectors supported the investment screening proposals that followed (Chan & Meunier, 2022), supporting an increasingly closed-door policy (Bauerle Danzman & Meunier, 2023).

By 2019, the EU’s liberal approach started to shift from a liberal stance (Stolton, 2023) to emphasise security concerns, allowing resources to be committed to military uses for the first time. The European Defence and Industrial Development Programme advanced arguments that military research and development could

boost civilian technology as well, justifying a budget even to those sceptical that security threats justified investments in Europe's military capacity (Scheinert, 2017). The groundwork preparing this shift outlined civilian technology spinoffs in consumer electronics based on previous military development projects (microwaves, smartphones, wifi, and navigation). The EU–NATO Centre of Excellence for Cybersecurity highlighted concerns in particular about the Chinese government's capacity to order Chinese companies to conduct surveillance of communications and exploit access to information with potential implications for industrial advantages, political interference, and military implications of Chinese control of communications, command, control infrastructure, as shown in research emanating from the joint EU–NATO Centre of Excellence on Cybersecurity (Kaska et al., 2019). However, funding for chip research and development remained limited (Fiott, 2020). Chip design remained largely in the US and production proceeded to concentrate in Taiwan (TSMC), with additional capacity in the EU (ASML in the Netherlands) and Korea (Samsung), and Huawei (China) was central to many national bids to construct telecommunications networks (5G) well into 2021.

By 2021, the Commission showed greater concern about the use of semiconductors and other technology in China's military build-up, and President Xi's concept of Military–Civil Fusion directing technology toward military use against Taiwan (European Commission, 2021). These concerns were visible in the Commission and Council after the Biden administration took office in 2021. Then we see transatlantic discussions over export controls and domestic development take place, and internal discussions within the EU and its member states.

The impetus for European industrial policy to spur chip development appears to lie in Washington D.C. and is fuelled further by existential threats to the EU. Proposals in Europe to boost domestic chip production came as early as 2020, but actual resources and laws followed American initiatives. The European Commission showed interest in transatlantic cooperation with the US as a response to Covid-19 shortfalls in the development of research, development, and industrial capacity as an alternative to each side competing with the other over resources. The European Commission's September 2021 State of the Union address announced the Commission's desire to revive efforts to produce chips for the EU market (European Commission, 2021). The reason was neither a perceived security threat nor a need to be self-sufficient but to address a market shortage exacerbated by over-reliance on foreign providers. Commission officials discussed chip development with American counterparts two weeks later at the first Trade and Technology Council meeting in Pittsburgh. That meeting was meant to reconfigure global supply chains in the aftermath of Covid-19 together, rather than in competition with the US. The European Commission's (n.d.) chip plans did not share American concerns with perceived Chinese threats to Western security, however, proposing

instead that Europe build on its earlier initiatives, permitting national state aid to build "open EU [chip] foundries" and "integrated [chip] production facilities" focused on ensuring supply and overcoming scarcity. Additional money, that labelled the Digital Europe Programme, would be redirected from within the EU's science promotion fund (Horizon) and funds earmarked to promote the digital single market (European Commission, n.d.).

By 2022, the passage of the Chips and Science Act generated concerns in the Commission that the US might pursue domestic chip manufacturing and re-industrialisation at the expense of the EU, luring European companies, talent, and investment to the US market seeking to ensure market access there and benefit from state subsidies in research, development, manufacturing, and packaging. In addition, the EU showed concern about similar initiatives from China, Japan, Taiwan, and Korea (Ragonnaud, 2022). US insistence on a link between chips, communications technology, and military security gained traction in the EU in the context of Russia's war on Ukraine. Mügge (2023) shows that the conflict brought together the relevance of chips, 5G infrastructure, software, cloud services, and, most prominently, artificial intelligence in contests with adversaries that the Biden administration had been advancing. This meant domestic re-shoring of chip production and export controls on chips and fabrication equipment, which targeted EU companies as well.

The EU Chips Act, proposed on February 9, 2022, and passed on July 25, 2023, is the European answer to the need for industrial capacity in chips, and to the American Chips and Science Act, which achieved first-mover advantages in industrial subsidies to semiconductor manufacturers. The Commission cited first the impact of Covid-19 on supply chains, which had hobbled industry (European Commission, 2023a). It envisaged 11 billion euros in subsidies and hoped for an additional 32 billion in national subsidies, with Industry Commissioner Bréton ensuring that companies and governments would enjoy an exemption from state aid restrictions that normally apply under EU law (Bounds et al., 2022). However, we see here a combination of motivations and approaches, with liberalism on the one hand (director general competition: Vestager) and a Waltzian strive for self-sufficiency and "strategic autonomy" without a specific threat (director general internal market: Bréton), without Russia's invasion of Ukraine generating a Waltzian threat response. This split is replicated between member states (see below in this section), making more ambitious plans difficult to support.

The absence of a threat response and the contested drive for strategic autonomy in 2022 can be seen in the conflict between Industry Commissioner Bréton and Competition Commissioner Vestager over state aid for chip development and production. While director general competition had issued block exemptions more easily during financial crises, Vestager warned against taxpayer subsidies for chip manufacturers and

encouraged governments to accept European dependence on foreign producers. Bréton, in contrast, saw independence from global supply chains as crucial, and national and EU projects as vital to achieving that goal. Commission President Von der Leyen appeared to take Bréton's side early on, although with a reference to Covid-19 disruptions to market functioning rather than his Waltzian push for strategic autonomy or a Waltian concern for national security. She touted 200 billion in funds from the historic NextGenerationEU fund (750 billion euros for Covid-19 reconstruction) being spent on digital industrial capacity while visiting the world's premier producer of extreme ultraviolet chip lithography fabrication equipment, ASML, in 2021 (Carrer & Lanzavecchia, 2021).

Within the EU Chips Act, national state aid dominated: Out of the 43 billion euros in subsidies headlined, almost all would be provided by the member states, and the 3.3 billion euros earmarked for research and development from the EU's budget would not be new money but diverted from other research and development programmes. The only new money in this fund came from the NextGenerationEU fund established to reconstruct Europe. This meant that national subsidies would be permitted without any meaningful restrictions from the Commission. Well-endowed member states stood to benefit strongly, raking in most of the economic and political advantages, while others would have to rely on NextGenerationEU investments. Parliament expressed support for the EU Chips Act to counter dependence on China, but also its reliance on the US. It also accepted the initiative on the grounds that it would enhance Europe's strategic autonomy and digital sovereignty (European Parliament, 2022). Both Parliament and Council passed the legislation without any significant amendments (Haeck, 2023a).

The effects of this construct result in different national contributions to semiconductor policy and production. The Netherlands focused on high-end research, development, and production, with late export controls. ASML had already developed into the world leader in extreme ultraviolet lithography used in the world's most advanced chips thanks supported by an ecosystem involving manufacturers, software developers, data centres, and cybersecurity specialists put in place and cultivated by the Dutch government. Export controls were accepted, though with a transition period allowing sales to China of equipment one generation old until September 2023 (Lin & Liu, 2023) and without involving the EU (Haeck, 2023b).

Germany, in contrast, remains divided across national bureaucracies and subnational governments on inward investment. The federal government introduced the right to ban Chinese involvement in critical telecoms, energy, and health infrastructure in 2021. It then blocked the Chinese takeover of chip manufacturer Elmos by Silex in 2022 on the grounds of protecting critical infrastructure (Rinke & Murray, 2022).

Chinese investment in Duisburg's shipping port also soured as German politicians linked China and Russia over Ukraine in 2022 (Kastner, 2023), but the chancellor himself allowed the Chinese shipping firm Cosco to buy the country's largest international port in his home city of Hamburg (Chazan et al., 2022). Meanwhile, German cybersecurity regulator BSI did not classify rail, including switches, routers, and associated software as critical infrastructure, allowing German rail company Deutsche Bahn to award Huawei a 5G infrastructure contract over the objections of the Green and Liberal (FDP) parties, both government coalition members and concerned about security risks (Marsh, 2023). The country's June 2023 Integrated Security Strategy further neglected chip development as a security issue (Federal Ministry of the Interior and Community, 2023). Nevertheless, a change to more restrictions is reported to be under debate (Marsh & Rinke, 2023; Pitel et al., 2023).

German chip production policy involves state governments and is decidedly industrial, ensuring domestic supply chains and keeping up with foreign performance in accordance with liberal policies, with increasing Waltzian concerns for self-sufficiency. Two states had attracted semiconductor production from US companies by 2023: Magdeburg (Intel; Hollinger & Waters, 2022; Mukherjee et al., 2022) and to Saarland (Wolfspeed), particularly directed at generating home-built capacity for electric vehicles and manufacturing. The German Chancellery touted the investments as proof Germany could compete with American subsidies in the Inflation Reduction Act regarding electric vehicles to support industry (Pitel, 2023).

Italy also secured an Intel chip assembly and packaging plant, again with a focus on relieving car production bottlenecks (Fonte & Piovaccari, 2022). Meanwhile, Intel negotiated cooperation with Spain's advanced Barcelona Supercomputing Centre for Advanced Computing, as well as labs in Poland and increased production in Ireland (Mukherjee et al., 2022). Overall, figures confirm that the bulk of investment is private and US in origin, with 88 billion over 10 years from Intel alone. This is both a success for the European plans, in terms of exceeding investment expectations, and a clear sign of transatlantic cooperation in chip production (friendshoring) rather than individual autonomy. The EU is following the US goal of recovering market share in chip production while inviting US companies to do the heavy lifting of investment and eventual production, while EU companies, many with state involvement, focus on high-end computing and chip production techniques that have no export restrictions to the US, but bar takeovers by US companies.

Italy also showed that the other side of chip and ICT infrastructure production is the issue of *protection from foreign takeovers*, with particular attention to countries outside the transatlantic allied space. Here we observe that Italy blocked the takeover of two semiconductor and high-tech component firms, one by a Chinese company,

and the other by a Hong Kong subsidiary of a US company in 2021, with the office of Prime Minister Draghi leading the charge (Fonte & Cao, 2021; Lanzavecchia, 2021).

Meanwhile, in France, the policy was markedly Waltian and statist. The state informed telecommunication companies in 2020 that if they selected Huawei equipment for 5G, they would be unable to renew their licences, effectively putting them out of business. The country's largest telecoms operator, Orange, in which the state owns a 23% share stake, subsequently awarded 5G infrastructure contracts to Nokia and Ericsson for its 5G networks throughout Europe rather than Huawei (Rosemain, 2022a). Domestic chip production for French companies (rather than reliance on Intel) was also secured when cooperation was announced between chip-maker STMicroelectronics (Franco-Swiss company) and wafer producer Soitec (France) for silicon carbide chips for the automobile industry in 2022 (Rosemain, 2022b). In addition, the French government supported projects in artificial intelligence and quantum computing. The Saclay technology cluster (Paris; Hollinger & Waters, 2022) related to French quantum computing projects (Cookson, 2022) was a key beneficiary and attracted a new research hub from Intel (Mukherjee et al., 2022).

Security issues under the veil of Waltian threat perception were also visible in French protection for cybersecurity and computing capacity. Before joining the Commission, Industry Minister Thierry Bréton had established a state-sponsored company known as Atos, which had a subsidiary called Evidian, specialised in computing and communications for the French security establishment, including cybersecurity, supercomputing, big data, and connectivity. Atos had fallen on hard times (Rosemain & Hummel, 2023), but the French government saw it as such an important strategic asset it shielded the company from a takeover bid from Thales, a French defence company with strong ties to the security ecosystem in France. Thales's plan was to acquire Atos' cybersecurity component BDS, furthering "sovereign big data and artificial intelligence platform for the public and private sector with a focus on defence, intelligence and internal state security" (Barbaglia, 2022) while allowing private equity firms to acquire the rest. The French state refused to countenance the sale to foreign entities as undermining the country's "digital sovereignty" (Barbaglia, 2022). It solved the conundrum by arranging for Airbus, a state-backed collaborative enterprise involving France, Germany, Spain, and the Netherlands, to take Evidian over. With this, the company's capacities remained at the disposal of the state, and for France's larger ambitions for a more independent European defence capacity (Donnelly, 2023b).

4.1. Expert Advice and Meagre Response on the ICT: Semiconductor–Cybersecurity Nexus

The EU's attention to chips, telecommunications, and cybersecurity has also evolved with a series of cyberse-

curity laws (Network and Information Security Directive, Cybersecurity Act) and the establishment and strengthening of the European Union Agency for Cybersecurity (ENISA). ENISA advises the EU on implementing and upgrading legislation, responding to new challenges, coordinates national authorities, and, since 2020, coordinates cybersecurity certifications for private enterprises. ENISA had flagged the importance of linking chip design, cybersecurity standards, and the EU's new General Digital Privacy Regulation as early as 2017 in consultations with leading producers ASML and NXP (Netherlands), STMicroelectronics (France), and Infineon (Germany, now a subsidiary of the US company Intel), as well as national cybersecurity authorities (ENISA, 2017). Doing so would have worked best with European production. The European Council endorsed ensuring the security and domestic production of microelectronics generally to multiple sectors of the economy, naming automotive, manufacturing, aerospace, space, defence, agriculture, and health care specifically on October 2, 2020 (Council of the European Union, 2020, para. 27; Negreiro, 2023).

However, even this liberal, supply chain focus on the interplay of cybersecurity and chips failed to generate an industrial policy response before the Chips Act. Gaps in the EU's thinking about protecting critical infrastructure remained as well, particularly in the EU's electricity grid that powers the devices being securitised. The European Telecommunications and Networks Operators Association together with the European Emergency Number Association expressed concern after the Russian invasion of Ukraine that electricity was not considered critical infrastructure throughout the EU, despite the fact that blackouts or shortages could crash the EU's telecoms critical infrastructure (Pollina et al., 2022).

4.2. Europe's Waltian Turn? The EU's Economic Security Strategy

Adherence to liberal and at times Waltian thinking yielded to the adoption of a Waltian lens of threat response in June 2023. The EU's Economic Security Strategy, in contrast to the EU Chips Act, is clear and unequivocal about the need to build up economic and technological capacity and to be selective in the EU's economic collaboration and interdependence due to security threats of a geopolitical, military, or non-agential nature. The Economic Security Strategy seeks to de-risk Europe's economic relations and boost its resilience, choosing to *promote* (NextGenerationEU, Chips Act, Critical Raw Materials, Net Zero Industry, and EU Industrial Strategy, targeted at resilience and sovereignty in energy, health, medicine, food, and defence), *protect*, and *partner* (with allies) to ensure critical industries while preserving "open and rules-based trade and investment, secure cross-border connectivity and collaboration on research and innovation" (European Commission, 2023b).

The Economic Security Strategy pays specific attention to ensuring supply chain resilience; ensuring

physical and cyber security of critical infrastructure, including communication networks (proposing a new Cyber Resilience Act and upgrade of the Network and Information Security Directive); ensuring technology security and preventing leakage of technology to hostile powers, including countering espionage, dual-use technologies, artificial intelligence, advanced semiconductors, and quantum computing; and potential for hostile powers to weaponise economic dependency against the EU and its member states (proposals for export controls pending). Most strikingly, *national security* is mentioned as being at risk, which the EU, its member states and private stakeholders should actively and collectively analyse and support. How Parliament and EU countries take up this Waltian turn remains to be seen. Debates are yet to be scheduled in the European Parliament, and heads of government have not yet responded.

5. Conclusions

This article gives an overview of the developments in the US and Europe regarding chip, computer, and communications technology strategy. It examines the extent, timing, and motivation of each side of the Atlantic regarding shifts away from open liberalism in economic interdependence and supply chains. Two alternatives are tested. The first is a shift to a Waltzian focus on self-reliance and the balance of capabilities for reasons of national security and power resources broadly understood, even in the absence of a concrete military threat. The second is a Waltian threat response, in which efforts to build up domestic power resources are designed to mitigate a real or perceived security threat. It shows that in the US, the Trump administration started with a Waltzian focus on relative capabilities, turning to narratives of potential Chinese security threats at the end of its term in office. In the Biden administration, there is clear and bipartisan agreement on building domestic chip manufacturing and infrastructure in response to a threat from China, as one of many challenges the US faces. This reflects a Waltian turn in US foreign policy that goes beyond what the previous administration conducted.

In the European case, the shift from liberal openness and interdependence in semiconductors, computers, and telecommunications to Waltzian self-sufficiency and then Waltian threat response was highly contested until the summer of 2023. A concerted focus on chip development and manufacturing in response to supply chain disruptions, such as those that accompanied the Covid-19 pandemic, did not materialise until the US initiated its own programme in 2022, accelerating fears within Europe that they would be left behind as the US and China boosted their own capabilities, and more vulnerable to shortages without their own industrial policy and chip capacity to go with it. Industrial policy on domestic chip manufacturing and ICT infrastructure development based on Waltzian calculations is the new common ground between EU institutions and key mem-

ber states. It is reflected in the primary focus on industrial chips for automobiles, consumer electronics and other internet-of-things products and services.

The Commission's European Economic Security strategy demonstrates that in 2023 it adopted a Waltian notion of a concrete threat demanding self-sufficiency and resilience, such as a Chinese attack on Taiwan and its semiconductor manufacturing, Chinese advances in military technology that could be used to undermine Europe's security, or the persistent threat of Russian aggression and destabilisation, layered on top of earlier concerns for addressing supply chain disruptions. Within the new strategy, the supply chain question shifts from disruptions to vulnerability to attack, with the risk depending on whether the countries supplying are allies or not, broadly understood (Genschel & Schimmelfennig, 2022). These Waltian threat-induced reactions build on Waltzian intellectual priors about strategic autonomy, which were both generalised in terms of threat (building up European resources and policies to keep up with the US and China) and much more weakly supported by the member states in Council, with France pushing strongly for strategic autonomy and Germany and others remaining unconvinced. Kelemen and McNamara (2022) place the phenomenon of EU securitisation in a broader literature on state-building during wartime, which intensifies urgency in agreement, policy response, and even committed financial resources.

Differences between Europe and the US have meaningful consequences, given the US's hard stance on independence and relations with China in chips and ICT infrastructure, and its demands on Europe to align its policies with its own. European positions are slower and weaker, given the weaker powers of the EU vis-à-vis the member states in foreign policy and more meagre resources, but more crucially, a split in foreign policy stances of EU member states. Germany is reluctant to abandon liberalism and interdependence. Member states geographically closest to Russia along with France support a threat-based response of industrial policy for European security. The Commission occupies the middle, reflecting traditional concerns to build up European independence for its own sake: as either strategic autonomy (full independence) or open strategic autonomy (friendshoring). While Commission recommendations to screen investment in 5G infrastructure, related technology firms, and build chip manufacturing companies resonate well in France, these have had a lesser impact in Germany, for example.

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Conflict of Interests

The author declares no conflict of interests.

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