

ASML: Passive Transmitter or Active Player?

UNCOVERING THE ROLE OF PRIVATE ACTORS IN THE EUROPEAN UNION'S PURSUIT
FOR OPEN STRATEGIC AUTONOMY IN THE SEMICONDUCTOR INDUSTRY

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ABSTRACT

European policymakers have been increasingly raising concerns about geopolitical tensions triggered by the technological competition between the US and China. As a result, the European Union has presented ‘Open Strategic Autonomy’ to improve its position in the technological competition. Scholars have indicated that Europe’s pursuit in open strategic autonomy can be attributed to the implications of weaponized interdependence. The theory of weaponized interdependence addresses the security risks of global economic networks, and although private actors play crucial roles in the theory, the original framework portrays them as passive transmitters of government policy.

This thesis sought to examine the situation in which this assumption is violated. This is done by examining different factors that can influence a company’s non(compliance) with public policy. In order to answer the research question, a single case study is conducted. The unit of analysis is a monopolist in the semiconductor industry, Dutch chip-machine manufacturer ASML. This unique case gives insights in the behaviour of a company when it is exposed to regulations resulting from weaponized interdependence. The results show that multiple factors – alignment of values and interests, fear for reputational damage and holding sources of influence over public authorities – can be drivers for (non)compliance. The implications of these results are twofold. Firstly, these insights can contribute to the role of private actors in the framework of weaponized interdependence. Secondly, this study helps to give insight in the conditions under which sincere cooperation between the private actor and the public authority is conceivable.

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LIST OF ABBREVIATIONS

5G	Fifth-generation
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CTO	Chief Technology Officer
EC	European Commission
EU	European Union
OSA	Open Strategic Autonomy
R&D	Research and Development
RBA	Responsible Business Alliance
TSMC	Taiwan Semiconductor Manufacturing Company
US	United States
WI	Weaponized Interdependence

1 INTRODUCTION

In March 2023, the Dutch government has confirmed that it will impose new export controls on ASML, the global leader in producing advanced microchips printing machines (NOS, 2023a). In a letter, Dutch Foreign Trade Minister Schreinemacher (2023) announced that because of technological developments and geopolitical context, it is necessary for international security to expand export controls on semiconductor manufacturing equipment. The agreement between the United States (US) and the Netherlands to introduce new export restrictions on advanced chip technology was made a couple of months before, and by imposing these restrictions, the Netherlands has complied to political pressure coming from the US. (Heack, 2023). The White House had expressed its concerns about the fact that when China would be able to produce the most advanced semiconductors in the world using the high-tech machines of ASML, they could use these for extensive military and artificial intelligence purposes (Amaro & Kharpal, 2023). Although Schreinemacher's letter doesn't specifically mention China, Heack (2023) implies that the policy is aimed at countering Chinese endeavours to overtake the US and other states like Taiwan, South Korea and leading European countries in the microchips supply chain. After successfully persuading the Dutch government, the US wants the European Union (EU) to follow and establish a European export regime (Van der Lugt & Van der Putten, 2022). The European Commission (EC) itself has indicated its aspirations to implement such a regime (Kerres, 2023). Great powers like China are gaining more technological influence and dominance over countries in Latin America, Africa, the Indo-Pacific – but also some countries in Europe. China is trying to spread authoritarian values over the world with ingraining them into the global cyberspace (Ringhof & Torreblanca, 2022). The 'Great Firewall of China' for example shields its own citizens from foreign influence, and at the same time China is trying to make other countries technologically dependent through its Digital Silk Road Initiative. As a reaction, the United States is trying to outweigh the Chinese influence by protecting the interests of major technology companies globally and investing and gaining advantage in military artificial intelligence and other technologies (Ringhof & Torreblanca, 2022).

In the 2021 State of the Union Address, EC President Ursula von der Leyen stressed that the EU has to invest in European technological sovereignty, which is one of the key aspects of the Open Strategic Autonomy (OSA) (Poutala et al., 2022). The concept of OSA consists of the idea that the EU should be able to have quicker responses to immediate threats, but also to make faster united decisions and improve its position in geopolitical competition (Foundation for European Progressive Studies, 2022). According to Miró (2022) the OSA is meant as an endeavour to reduce the EU's external dependencies in a range of critical sectors. It also means that the EU will seek to strengthen its partnerships and cooperation with other countries and regions, in order to achieve common goals and to promote shared values. One of the key goals for OSA is ensuring 'digital sovereignty' and strengthening capacity in data management, artificial intelligence and cutting edge technologies (European Commission, 2021).

Scholars indicate that the rise of OSA can be related to a changing global environment: the rise of China, the COVID-19 pandemic and the war in Ukraine; but also to the concept of weaponized interdependence (Lavery & Smid, 2022; Schmitz & Seidl, 2022b). Scholars of weaponized interdependence have argued how global economic networks have security consequences, as states are becoming increasingly interdependent where they first have been autonomous (Farell & Newman, 2019). They see controlling flows of information to gain advantage over other actors as a specific form of economic statecraft (Mastanduno, 2021). To understand globalization and power, Farell and Newman have placed networks such as financial communications, supply chains and the internet at the heart of the theory, something what has been neglected by previous international relations scholars. The importance of financial and information markets for geostrategic outcomes is starting to be recognized by security scholars (Drezner, Farell & Newman). Following their article, Drezner, Farell and Newman published the book *The Uses and Abuses of Weaponized Interdependence* in 2021, which addresses different facets of weaponized interdependence.

The aim of this thesis is to examine how a specific private actor, Dutch chip-machine manufacturer ASML, would respond to the initiatives proposed by the European Union in the pursuit of strategic autonomy. The primary objective is to analyse factors that may drive (non)compliance of the private actor with the regulations stemming from strategic autonomy. ASML stands out as a unique case as the company holds a monopoly in the market for the newest and most advanced lithography machines, making it the most crucial chip-machine supplier for the semiconductor industry (O'Grady & Kenyon, 2023; Ministerie van Economische Zaken en Klimaat, 2022). Combining the insights from weaponized interdependence and management literature (Drezner, 2021; Farell & Newman, 2021; Giumelli, 2017; Gjesvik, 2023; Mastanduno, 2021; Onderco & Van der Veer, 2021), expectations about the behaviour of ASML will be introduced. Following, these expectations are assessed using the available data, which consists of various press releases, interviews in the media, news articles and other public documents. By conducting a single case study on ASML, the analysis should create a comprehensive presentation of the key features and viewpoints of the company. Finally, these insights can help understand what factors can influence the level of cooperation and compliance of ASML. Accordingly, the research question is formulated as follows:

“What factors influence the (non)compliance of Dutch chip-machine manufacturer ASML with the regulations proposed by the European Union in the pursuit of Open Strategic Autonomy?”

Hence in this thesis, the focus will be on the response of private actors in the case of the weaponization of interdependence. Farell and Newman (2021) have recognized that private actors such as firms are fundamental actors, as they play crucial roles in the economic transactions taking place within the networks. However, in their original theory they haven't provided real agency to the businesses but have rather depicted them as passive actors that convey to government policy. They suggest that it is essential

to consider the implications when the assumption that firms are passive transmitters is violated (Farell & Newman, 2021). Gjesvik (2023) is one of the first scholars to examine the relationship between states and the private corporations holding the resources that states seek to exploit. He acknowledges that the framework of weaponized interdependence rests on the assumption of alignment between the state and private companies, and has studied the capacity of the state to mobilize the private actors that own and maintain the centralized nodes. He suggests that a state cannot exploit its structural position if it has to compete with a reluctant private sector. Where Gjesvik (2023) places a greater emphasis on examining state's capacity to mobilize the private actors, this research aims to investigate the public-private relationship from the perspective of the private actor. Especially when government regulations target private actors, such as the export restrictions targeting ASML, it is of interest to analyse how this company responds to the regulations. ASML is among the list of the largest companies in the chip industry, with a revenue of 22 billion dollars (Eshuis, 2023). As the chip industry plays a crucial role in the geopolitical landscape between the US and China, ASML has become a significant player in this matter (NOS, 2023b).

Interconnectedness and interdependence has long been perceived as a global public good, however European policymakers have raised concerns about the geopolitics of technology, which was triggered by the technical competition between the US and China (Okano-Heijmans, 2023a; Rühlig et al., 2019). There have been growing concerns about the economic and social influence of non-European technology companies, which might threaten EU citizens' control over their personal data, and constrain European digital growth and law enforcement (European Parliament, 2021). While technology improves living standards, it also affects the conduct of states and war. Khan et al. (2022, p. 442) even argue that 'technology is absolutely the key enabler of modern statecraft'. Technology is at the heart of our society and digital technologies have embedded themselves in every aspect of economic and social life (Timmers, 2021; Schmitz & Seidl, 2022). The development of technology is an important feature of globalization and competitiveness and has direct influence on politics, military activities, warfighting and peace-making (Khan et al., 2022). The notion of 'technological sovereignty' has emerged to promote the concept of European leadership and strategic autonomy in the digital field; it refers to Europe's ability to act independently in the digital world (European Parliament, 2021). EC President Von der Leyen emphasized the importance of technological, or digital, sovereignty in her political guidelines (2020, p. 29): 'Digital resilience is about ensuring that the way we live, work, learn, interact, and think in this digital age preserves and enhances human dignity, freedom, equality, security, democracy, and other European fundamental rights and values.' In order to reach technological sovereignty, successful collaboration with the private actors that play key roles in the supply chains is a key to success (Matllin et al., 2022).

2 LITERATURE REVIEW AND THEORETICAL FRAMEWORK

In this chapter, the focus will be on examining the available literature relating to the theory of weaponized interdependence. Initially, an overview of the fundamental aspects of this theory will be presented. Subsequently, the literature on the geopolitics of technology will be presented, considering Europe's Open Strategic Autonomy as a response to the threats of weaponized interdependence. Specifically, the geopolitical tensions in the semiconductor industry will be discussed. Finally, the involvement of private actors in this context will be analysed, and their expected behaviour will be formulated based on the reviewed literature.

2.1 INTRODUCING WEAPONIZED INTERDEPENDENCE

Although the notion that the interdependence of states affects international relations is not new, Farrell and Newman (2019) introduce a novel concept in their article: Weaponized Interdependence (WI). They argue that global economic networks have security consequences as they create interdependencies between states and diminishing their autonomy, something that scholars already agreed on. However, Farrell and Newman suggest that scholars hardly recognize how states may leverage network structures as a coercive tool, and under which circumstances. They develop a new understanding of state power and shed light on the structural aspects of interdependence. Furthermore, they show how the economic networks of interdependence intersects with domestic institutions and norms. In asymmetric network structures, some nodes are "hubs" and are far more connected than other. Hubs are central intermediaries in communications structures, and for other actors these hubs are difficult to avoid while communicating. This asymmetry potentially causes WI, in which some states are able to leverage independent relations to coerce others. Especially states with political authority over the crucial nodes in the networks are in a unique position to impose costs on others such as money, goods and information travels through these nodes. These states can then weaponize networks to either choke off economic and information flows, gather information, discover and exploit vulnerabilities or change policies and block unwanted actions (Farrell & Newman, 2019). They define WI as 'states' use of global economic networks to achieve geostrategic objectives' (Farrell & Newman, 2021, p. 291).

Farrell and Newman (2019) distinct two forms of weaponization, the panopticon effect and the chokepoint effect. In the first form, states have an informational advantage in understanding their rivals' intentions and tactics. It outlines a situation in which one or a few central actors have the ability to observe the activities of others, which can be attributed to their physical access to or jurisdiction over hub nodes. In other words, they use their influence to obtain the information that passes through the hubs. If states have this type of information and access to a hub, 'they gain strategic advantage in their effort to counter the specific moves of their targets, conduct negotiations, or create political frames' (Farrell & Newman, 2019, p. 55). The second form of weaponization is the chokepoint effect. This

involves the capacity of privileged states in limiting or penalizing the use of hubs by other states or private actors. States that control the hubs have considerable coercive power as hubs offer efficiency benefits and thus are very difficult to circumvent. However, only states that have physical or legal jurisdiction over hub nodes can exploit the benefits of WI. These hubs are mostly located in the advanced industrial countries, especially in the US. Therefore, only the strongest states and statelike entities, as China, the European Union and the United States, have the adequate potential to enjoy the benefits of WI (Farell & Newman, 2019; Mastanduno, 2021). There are relatively few states that effectively exercise control over economic networks that are considered critical by state and private actors. The domestic environment is an enabling variable in WI, as the ability of a state to weaponize global networks depends on domestic configurations of power and state-society relations. Some domestic institutions may lack coercive power in terms of capacity and key norms (Farell & Newman, 2019; Gjesvik, 2023).

The weaponization of interdependence can be seen as an instrument; states use it by exploiting power in regional or global networks that coordinate commercial, financial or technological transactions (Mastanduno, 2021). This seems to be similar to exerting economic influence through measures such as sanctions. However, there is a critical distinction according to Mastanduno (2021, p. 65): ‘economic influence attempts rely less on networks and more on the dependence of a target on the sending state’s home market or sources of supply.’ Drezner (2021) describes two drivers of the weaponization of interdependence. The first is, paradoxically, the inability of central actors to comprehend that it is possible for them to weaponize the existing embedded networks. This lack of awareness puts potential targets at ease; less powerful actors allow further interdependence which increases the probability of future exploitation. The second driver is the prominence of non-state actors. Smaller or weaker states are less likely to be cautious of non-state actors compared to state-owned enterprises or national governments when they establish similar structures – which increases the possibility of WI. It has showed that different actors such as great powers, smaller states, and non-state actors have an increasing interest in weaponizing key economic and social networks (Drezner, 2021).

2.2 WEAPONIZED INTERDEPENDENCE IN PRACTICE: AN ILLUSTRATIVE CASE

In his chapter, Segal (2021) illustrates how the competition between the US and China over fifth-generation (5G) communication networks is an example of the structure and processes of WI. The interdependence between the global information and communication technology supply chains from China and the US had been seen as a stabilizing influence, and both countries believed that this connectedness fosters innovation and economic growth. However, both countries came to wonder whether the vulnerabilities created by interdependence, and the risks of WI, don’t prevail over the benefits of the interdependence. In an attempt to reduce the ability of the US intelligence agencies to gather information and launch disruptive cyber operations, China wanted to make the information and

communication technologies more secure and governable. In 2017, China's Digital Silk Road Initiative was launched as a part of The Belt and Road Initiative. The goal of this global investment plan was to build a complex infrastructure network and use investment and market expansion in digital technologies to have more influence in international standard-setting organizations (He, 2022). Many big tech companies work closely together with the Chinese government in pushing these initiatives. China's government has for example relied a lot on Huawei – a Chinese multinational telecommunications company – in building 5G communication networks all over the world (He, 2022). Huawei is in fact currently leading the field of 5G infrastructure and this technology has been seen as potentially game changing (Rühlig et al., 2019).

This has drawn scrutiny in America and US officials have claimed their concerns about the fact the panopticon effects that had flowed to the US would be captured by China as it was building 5G networks around the world (Segal, 2021). Furthermore, concerns were raised about the fact that Huawei is obedient to the demands of the Chinese government and effectively would be the extension of the Chinese Communist Party (Sacks, 2021). According to this analysis, the Chinese government would have the ability to use the 5G networks to could collect intelligence, monitor critics and steal intellectual property. Another concern according to Sacks (2021) is that Huawei, commissioned by the government, would use the threat of disabling networks as a leverage in certain countries in order to exert coercive pressure on that country. Two Chinese companies, Huawei and ZTE hold approximately 40 percent of the global market share for 5G infrastructure. Huawei has secured over ninety commercial contracts for building 5G equipment (Segal, 2021).

The White House was alarmed by the reach of Huawei and attempted to damage the Chinese company by employing economic statecraft: blocking Chinese access to the US market, filing cases against Huawei for sanctions violations and intellectual property theft, and exerting pressure on friends and allies to choose alternative suppliers of 5G networks (Segal, 2021). The Trump administration exerted pressure on countries to stop using Chinese components in their 5G infrastructure. Europe was even pressured to enact an outright ban of Huawei from its 5G infrastructure (Rühlig et al., 2019; Sacks, 2021). The White House also made an attempt to weaponize interdependencies by cutting the telecom giant off from critical supply chains and components. Export, reexport and transfer of specific items to foreign entities was blocked by this – especially in the global supply chains of semiconductors and mobile operating systems. Despite the leveraging of choke points in the global supply chain, Huawei has survived by producing its own components, stockpiling parts, and diversifying suppliers (Segal, 2021). This resulted in China to be less dependent on foreign chips, and especially Taiwan Semiconductor Manufacturing Company (TSMC), an important supplier of chips, has managed to avoid the harsh winds coming from the US (Segal, 2021). Moreover, non-state actors weakened the initial efforts by finding loopholes in the export control laws.

This Sino-American controversy over Huawei's role in the 5G infrastructure is considered a security threat that leads to geopolitical risk (Kahn et al., 2022). The exploiting of Huawei and ZTE's role in the 5G network could lead to enhanced access for the Chinese government to confidential or sensitive data, compromising national security (Drezner, 2021). The Huawei case illustrates how the United States have used the weaponization of interdependence, and how some of the outcomes of these efforts were unintended. These outcomes show that actors are at risk of losing their network centrality when they abuse their role as a central hub (Drezner, 2021). According to scholars, this situation also outlines Europe's vulnerability, and how they risk being part of a geopolitical struggle for technological leadership (Kahn et al., 2022; Rühlig et al., 2019). On the one hand, for some European countries China has an important position in the value chain for information and communication technology, and on the other hand is the EU dependent on the US in terms of security, as the is US dominating in software development (Rühlig et al., 2019).

2.3 SECURITY ISSUES FOR THE EUROPEAN UNION: DIGITAL SOVEREIGNTY

Due to the weaponization of interdependence, along with the rise of China, the COVID-19 pandemic and the war in Ukraine, the EU finds itself in a less stable global environment (Lavery & Smid, 2022; Schmitz & Seidl, 2022b). This has been a wake-up call, and forced the Union to react and rethink its roles and interests in the world (Schmitz & Seidl, 2022b). This is where Open Strategic Autonomy (OSA) became the heading of the EU's management of interdependence (Helwig & Sinkkonen, 2022). Poutala et al. (2022) show that the EU's response to the growing risks can be seen as an attempt to 'de-weaponize' its interdependence, meaning that the EU tries to prevent that their critical hubs are being exploited by a future adversary. However, because the Union has limited competence on issues related to nation security, the impact of these attempts remain limited. Poutala et al. (2022) have studied the possibilities for the EU to practice authority over crucial hubs in port infrastructure and 5G, and how it could take advantage of chokepoint effects. However, because of national security competence limitations, the Union cannot effectively control the hubs as it does not have exclusive authority. They concluded that efforts to obtain strategic autonomy is based on the 'sincere cooperation' between EU institutions and member states.

The concept of OSA refers to a list of policy issues, amongst which are: defence, foreign, industrial and trade policy, financial governance, climate change, energy policy and digital sovereignty. OSA is seen as a core principle in justifying the actions undertaken by the EU in the post COVID-19 world (Miró, 2022). Okano-Heijmans (2023a) argues that this is a paradigm shift in the EU and its member states; turning away from market-based thinking and the concept of an open economy that dominated European policy, towards a more closed economy thinking. The new paradigm involves geostrategic thinking, with a shift from a focus on trade to a focus on technology. According to Schmitz and Seidl (2022b, p. 835), OSA's doctrine embodies 'qualified openness': 'Europe wants to remain as open as possible, but

also needs to become as autonomous as necessary', in order to protect and promote European interests. Before 'open strategic autonomy', proposals for 'strategic autonomy' were made, especially by the French, acknowledging the risks of asymmetric dependencies in certain sectors (Molthof et al., 2021). However, other member states were concerned that strategic autonomy would wear away some of the benefits of interdependence and fuel protectionism. Therefore, the European Commission insisted that the goal would be strategic autonomy, but 'open', where the benefits of interdependence would be preserved (Molthof et al., 2021). The goal is to uphold the capabilities of the EU without being constrained by technological dependencies (Rühlig, 2023).

Technological dependencies is a key area of strategic autonomy concerns, as China's emergence as a leader in the technological field has posed challenges for the EU to remain technologically sovereign (Poutala et al., 2022). Because of rapid technological development and power shifts, Europe has to come worry about its digital sovereignty (Okano-Heijmans, 2023a; Schmitz & Seidl, 2022). After EC President Von der Leyen mentioned digital sovereignty in the Political Guidelines for the 2019-2024 mandate, the notion of digital sovereignty has been ever-present in the EU's official documents and public statements (Miró, 2022; Schmitz & Seidl, 2022). According to Okano-Heijmans (2023a), the COVID-19 pandemic has underlined that digital connections are an opportunity for people to work, shop and interact online; but at the same time emphasized the digital divides – meaning the inequalities regarding the ability to access and use digital technologies. The pandemic revealed Europe's dependence on products, critical materials and certain value chains (Breton, 2020). Along with this, the war in Ukraine, that started in February 2022, exposed challenges to digital connections. Disruptions in the tech supply chain caused by COVID-19 and the war triggered countries to prioritise the security of global trade over economic interests, which also has been referred to as 'friend-shoring' (IIS, 2022; Okano-Heijmans, 2023a).

Thierry Breton, European Commissioner for the internal market asserted that 'in a world where the balance of power between blocs is hardening, the race for autonomy and power is in full swing' (Breton, 2020). Innovation in sectors such as energy, aerospace, material technology and nanotechnology have influenced security perceptions in political, economic and military spheres (Khan et al., 2022). Europe being part of geopolitical struggles between the United States and China could have a significant impact on the future of the EU. It is therefore important for the Union to keep defending its interests and values in the context of the competition for technological leadership (Rühlig et al., 2019). In order to safeguard European values the main institutional actors in the EU have discussed strengthening their digital sovereignty (Roberts et al., 2021). However, there is not one ambiguous and coherent definition of this concept, and the terms digital sovereignty and digital autonomy are being used interchangeably (Okano-Heijmans, 2023a; Roberts et al., 2023). According to Timmers (2021) sovereignty in the digital realm includes having ownership in all technologically constructed assets, for example health data and one country's internet domain name. Okano-Heijmans (2023a, p. 9) defines the concept of digital

sovereignty as follows: ‘EU digital autonomy concerns the ability – as a global player, in cooperation with international partners, based on own insights and choices – to secure public interests in the digital domain and to be digitally resilient in an interconnected world.’

Moreover, also different actors like member states, nongovernmental organizations and businesses have used digital sovereignty as a central discursive reference point (Schmitz & Seidl, 2022). Strengthening digital sovereignty would mean the strengthening of EU’s role in an interconnected world, and promoting and protecting the Unions core interests and fundamental values, such as human dignity, freedom, democracy, equality, the rule of law and respect of human rights (Roberts et al., 2021). As the EC has declared: ‘The EU’s digital sovereignty will depend on capacity to store, extract and process data, while satisfying the requirements of trust, security and fundamental rights’ (European Commission, 2021, p.10). According to Commissioner Breton (2020), digital sovereignty rests on three inseparable pillars: computing power, control over data and secure connectivity. He proposes three ‘keys to sovereignty’: firstly, Europe has to increase its capacity in the development and producing of processors, as microelectronic components play an important role in some key value chains such as tablets and smartphones, cars, supercomputers, artificial intelligence and defence. Secondly, the development of autonomous European clouds should guarantee companies that their data will be protected against external cyber interference. Lastly, Breton (2020) emphasizes that Europe needs to think about a constellation of satellites in low orbit to give Europeans access to broadband connectivity wherever they are on the continent, and to increase the level of security.

2.4 AGENCY OF PRIVATE ACTORS IN WEAPONIZED INTERDEPENDENCE

Reflecting on weaponized interdependence, it becomes apparent that it is a structural theory of power rooted in economic interactions. These interactions are operating through networks in which private actors play crucial roles; they are the ones who provide these networks (Jentleson, 2021). The original theory of WI does acknowledge that firms are important actors, however it doesn’t provide real agency to businesses, but rather treats them as passive transmitters of state policy. Farrell and Newman (2021) indicate that it will be crucial to think about what happens when the assumption that businesses don’t have agency is violated. The framework of WI only has theoretical bases about the alignment between the state and private companies, and have left empirical validation underdeveloped. These assumptions need stronger grounding in empirical cases to be generalizable more widely (Gjesvik, 2023).

In recent years, some scholars have already paid attention to the role of private actors in weaponized independence (Gjesvik, 2023; Jentleson, 2021; Mastanduno, 2021). Jentleson (2021) indicates that businesses based in the United States often undermined US foreign policy. With the Trump administration, the public-private interests in the US have diverged. To keep out of the reach of the US government, American companies have been acquiring corporate profits from global investments in foreign tax havens. Jentleson (2021) also illustrated how the Iran case, where the US used choke-point

effects to pressure financial sanctions on Iran, is a prominent example of WI. In this case, the European businesses that were targeted by the extraterritorial sanctions saw greater risks in not complying with the US measures, and therefore the efforts of companies that did try to circumvent the American sanctions have had limited impact. Mastanduno (2021) has highlighted some of the consequences of WI, and asserts that private actors have been experiencing some negative effects. He argues that weaponization has a certain reinforcing effect. The use of weaponization expands state capacity: making it easier for the state to weaponize in the future. This is especially the case when states are provoked by security threats and crisis. This has happened in the US after the cold war, as the US government got the authority to restrict any type of trade to any destination. The right of private firms to export their products was turned into a privilege that had to be granted by the state. Many multinational organisations, even overseas, were targeted by these sanctions and have complained of an unhealthy sanctions habit by the US government since then. It became routine to use the sanctions against different targets and for different purposes (Mastanduno, 2021).

In his article, Gjesvik (2023) expands the framework of WI and made the assumption that the position of states as the primary actors is undermined and challenged by private actors as increasingly powerful and autonomous actors. He analysed the relationship between private companies and states in WI, drawing on developments in the industry for constructing and operating submarine cables. He found that a shift in the market has significantly reduced the ability of states to control important market players. According to Gjesvik, the public-private relationship in WI is dynamic and can be constantly (re)produced by market logics and actors. He describes four mechanisms that influence the public-private relationship: the power asymmetries between state and companies, their alignment of values and interests, the affordances of the network structure and the states' legitimacy in authority. These mechanisms can strengthen or weaken the ability of states to exploit private resources. Additionally, Onderco and Van der Veer (2021) have described four implications of sanctions for firms, these include the loss of partners and benefits, the limits of economic exchange, the establishment of new competitors in the markets and reputational costs.

2.5 WEAPONIZED INTERDEPENDENCE AND ASML

The previously discussed literature on the weaponization of interdependence helps to construct specific expectations about the behaviour of private actors. On top of that, the following section takes into account certain management literature to create a comprehensive understanding of how private actors operate. The two assumptions that result from the expectations are either compliance or noncompliance. The first expectation concerns the alignment of values and interests, as this is one of the mechanisms that influence the public-private relationship (Gjesvik, 2023). According to Sierra et al. (2019, p. 4-5) values can be defined as 'preferences over behaviour or preferences over states in the world'. These values decide what course of action is better and indicate one's idea of what is right and wrong.

According to Gjesvik (2023, p. 728), ‘sharing a worldview, culture, or ideals can build a foundation of willing collaboration’. Sharing a worldview can take place at the organizational level and at the individual level (Gjesvik, 2023). At the organizational level this means that states and companies share the same interests and goals, if this is the case it is less important who holds authority as both actors want the same thing. On the individual level ties can be created through for example shared employment histories, revolving-door dynamics or similar backgrounds, however in this research design these elements are challenging to examine. The expectation is that when the values and interests of the European Union and the private actor are aligned, it will be more likely that the private actor will comply with the regulations.

H1: When the values and interests between the European Union and the private actor are aligned, they are more likely to comply to the regulations.

A consequence of sanctions is the potential reputational costs for firms (Onderco & Van der Veer, 2021). Reputation is the second driver of (non)compliance. Reputation can be seen as the overall perception of a firms appeal, and how their actions contribute to their appearance in relation to social expectations (Truong et al., 2021). Social motives can drive firms to strive for the respect of other actors, whether they are consumers, other peers or regulators (Giumelli, 2017). The fact that the geopolitics of technology has become subjected to political contestation, this could lead to the expectation that firms risk the loss of reputation when they are not complying with the regulations (Herrera, 2003).

In management literature, corporate reputation can be seen as a strategic asset which contributes to the performance and survival of the firm (Truong et al., 2021). Scholars examined that firms have seen decreases in their value and reputation due to irresponsible supply chain practices, for both consumer-to-business firms as well as business-to-business firms. Hoejmose et al. (2014) have studied the relationship between responsible supply chain management and corporate reputation. They suggest that firms might fail to realize the potential reputational gains when they don’t implement responsible policies. For example, firms such as Nike, Primark and Adidas suffered loss of income as a result of negative reputational media exposure due to irresponsible supply chain practices. Negative media attention together with consumer boycotts are examples of reputational costs; when firms are faced with this, they can implement corporate reputation protection to prove its stakeholders that they took reasonable steps to prevent an incident from happening (Hoejmose et al., 2014). Thus, reputation can be seen as a form of social judgement that reflects the effects of symbolic and substantive actions, wherein companies seek for positive social judgements. When companies perform symbolic actions, they are trying to show that they are complying with social norms and expectations. However, sometimes these actions can be solely rhetorical and do not actually result in real change or implementation of the expected behaviour (Truong et al., 2021).

H2: When the private actor fears reputational damage from noncompliance, they are more likely to comply to the regulations.

Another mechanism that influences the public-private relationship is the extent to which the state, or state-like entity, has authority over the private actors. According to scholars, states experience a decreasing ability to mobilize domestic companies in certain areas (Gjesvik, 2023; Weiss & Thurbon, 2018). In some cases, private actors hold more political authority over society and economy than states do (Gjesvik, 2023). Especially when corporations take an extensive part in the national economy, they hold a certain amount of leverage over the state. They could for example relocate or disinvest their businesses if the cost of complying to the regulations outweighs the costs of abandoning the market (Gjesvik, 20223).

Fuchs and Lederer (2007) have studied the different facets of business political power in global governance. They distinguish three types of power: instrumentalist, structuralist and discursive. For the first type of power, one could think of activities that businesses exercise in order to influence the behaviour of formal political decision-makers, such as lobbying and campaign or party finance activities. The structuralist approach emphasizes the underlying economic and organizational structures, as well as interdependencies, that give businesses the ability to influence the policy process in the agenda- and rule-setting phase. This is what Fuchs and Lederer (2007, p. 7) describe as self-regulation, meaning that it allows ‘business actors to influence the choice of area for which rules are designed as well as the actual design, implementation, and enforcement of these rules’. Lastly, the discursive approach assumes that businesses try to exercise political power by influencing the public debate on specific political issues and societal norms and values. Likewise, efforts to frame certain actors in the political process as good or bad, and business promotion of consumer and entertainment culture are also part of the discursive toolbox. They thus find that corporations can exercise power in global governance to micro-level processes as well as macro-level processes. To study sources of political power one should pay attention to activities such as lobbying, agenda- and rule-setting, and communicative activities practiced by private actors.

Weiss and Thurbon (2018) have examined that US companies and US state are intertwined in networks of power. The increased economic power of US companies has come at the expense of US state itself. In their research, they discuss the transformative capacity of a state, which refers to ‘the state’s ability to drive through innovation projects in order to maintain technological leadership’ (Weiss & Thurbon, 2018, p. 784). This capacity has long depended on the willingness of private actors to partner with the state and pursuit the state’s technological goals. However, because of the offshoring of manufacturing, the state’s capacity for technological innovation has also moved away. Furthermore, companies have stayed out of the extractive reach of the state by shifting profit offshore, which has led to a reduce in federal revenue from corporate tax and weakening the state’s capacity. When this situation occurs, firms

hold sources of influence and authority which they can use to challenge state authority. Additionally, according to Giumelli (2017), private actors can have more knowledge than state institutions, especially due to the growing complexity of technological innovation. When it comes to creating the specific regulations and guidelines, state authorities need to have at least as much knowledge as the private actors. If private actors do not receive specific instructions regarding what is expected from them, the implementation of regulations is delegated and firms have margin to make substantive decisions themselves. Concluding, when the private actor is involved with politics through lobbying, agenda- and rule-setting, tries to influence the public debate, or has more technical knowledge than state institutions, it has the capacity to challenge state regulations. The previously mentioned activities can be seen as sources of influence, hence the expectation is that when the private actor has certain sources of influence, they will be more likely to challenge the regulations.

H3: When the private actor holds sources of influence over the state, they are more likely to challenge the regulations.

Onderco and Van der Veer (2021) also take into account the loss of partners and benefits that the firms might experience as a result from regulations. The imposition of the regulations can create economic barriers and increase the cost of conducting business (Onderco & Van der Veer, 2021). The loss of partners and benefits in the economic transaction can potentially lead to the loss of revenue. According to them, European firms that are driven by economic profit are likely to disregard sanctions, and find ways to circumvent them – by for example exporting to economies geographically or politically close to the target of the sanctions. Firms are assumed to be profit-maximisers and therefore weigh the profits from business against (non-)compliance (Giumelli & Onderco, 2021). In the case of sanctions, some aspects in conducting business such as processing financial transactions, shipping goods or delivering services have become problematic for private actors (Giumelli & Onderco, 2021). However, in contrast to sanctions, the regulations resulting out of OSA don't necessarily have to lead to revenue loss for the European private actors. In fact, the aim of this doctrine is to strengthen manufacturing activities within Europe and supporting the scale-up and innovation for the supply chains (European Commission, 2022a). The European policy thus also has the potential to be profitable for firms. According to Giumelli (2017), profit-driven actors would only engage with public authorities whenever it contributes to the maximisation of their profits. Furthermore, firms that are profit driven can also fear the imposition of penalties and fines (Giumelli, 2017). Accordingly, the expectation is that when revenue loss is potentially a consequence of the regulations, the private actor has incentives to circumvent them.

H4: When the private actor potentially loses revenue, they are more likely to challenge the regulations.

3 RESEARCH DESIGN

In order to answer the research question “*What factors influence the (non)compliance of Dutch chip-machine manufacturer ASML with the regulations proposed by the European Union in the pursuit of Open Strategic Autonomy?*”, this thesis will make use of a single case study. This chapter provides an explanation for the rationale behind conducting a single case study and highlights the uniqueness of ASML as the chosen case. Additionally, the data collection and the operationalization of the key concepts will be presented.

3.1 CASE STUDY DESIGN

In this research, a single case study is conducted. A case study is a popular research design, and has many different definitions (Smith, 2018). When conducting a case study, the research is usually qualitative, has a small-N and is aimed at investigating the properties of a single case (Gerring, 2004). A case can be various things: a group, an organization, a country – even a law or a decision (Van Thiel, 2014). This method can help to understand a real life phenomenon considering relevant contextual conditions. It has an exploratory, explanatory and descriptive character, in which the interaction of multiple variables presented via documents, quotes, samples and artifacts are examined (Smith, 2018). According to van Thiel (2014), these types of study design typically concentrate on a limited number of cases, in which the situations are studied in depth. In empirically analyzing the responses of private actors to certain regulations, the researcher can choose between breadth and depth: either studying the reaction of a large number of groups or studying the reactions of a limited number of groups in more detail (Ghemawat & Khanna, 2003).

There is a number of benefits to conducting a single case study in comparison with a multiple case study. Some scholars namely argue that focusing on comparison can diminish the depth of single case description and thus can lead to reduced precision. The tendency to overlook uniqueness and complexities increases, and studying differences fundamentally results in more inaccuracies than simple measurements (Richie et al., 2014). The primary advantage of this research design thus is that it provides more detailed information than other methods such as comparative case studies and surveys (Neale et al., 2006). Furthermore, according to Kennedy (1979) generalizability, or external validity, is a matter of degree rather than a binary decision. He emphasizes that the process of generalization is not solely determined by the quantity of observations, but rather by the specific types of units that are being observed. In the following section I will elaborate more on why ASML is a unique case in the context of the research. However, there certainly also are some limitations to conducting a single case study. Single-unit research designs frequently lack representativeness, meaning that the degree to which causal relationships observed within that single unit can be assumed to hold true for a broader set of units is limited (Gerring, 2004). It thus will be difficult to generalize findings to other situations, either because the case is unique or because the results only apply to the particular context in which it has been

examined. This results in a low external validity, however on the contrary, the internal validity tends to be high due to the wealth of information collected (Van Thiel, 2014). Additionally, when conducting a single case study, this leaves out the possibility of comparing the results with a different case, which could lead to a decrease in effectively establishing plausible explanations (Richie et al., 2014). Another limitation of this design is the risk of biased findings and collecting data in an unsystematic way; when conducting case studies the data collection has to be systematic in order to ensure validity and reliability (Neale et al., 2006).

3.2 CASE SELECTION

ASML Holding NV (ASML) is a Dutch supplier of semiconductor manufacturing equipment, with headquarters based in Veldhoven and offices across Europe, the US and Asia. The company designs and manufactures lithography machines and provides chipmakers with hardware, software and services that is required for the production of chips. These chips are for example essential for smartphones, data centers and new 5G technology (Bronzwaer, 2023). In Europe, there is just a handful of firms with a leading position in the semiconductor industry (Cian & Nardo, 2022). ASML is currently the most important supplier of chip-machines for the semiconductor industry (Ministerie van Economische Zaken en Klimaat, 2022). In 2020, ASML accounted for more than 12% of total EU turnover in the sector (Cian & Nardo, 2022).

ASML is a monopolist: it holds a 100 percent market share in the EUV-machines market and approximately 85 percent in the overall lithography market. This is due to the fact that it is the only company in the world that has the capacity and technology to produce the newest lithography machines (O'Grady & Kenyon, 2023). The company therefore has little to no competition (Kasteleijn, 2020). Studying ASML in the context of geopolitical tensions in the semiconductor industry is very relevant as the company has inadvertently become a pawn in the technology war between China and the United States (O'Grady & Kenyon, 2023; Witteman, 2022a). In addition, ASML receives substantially more media attention than other European firms in the semiconductor industry, as a result there is an abundance of information and data regarding ASML available online, while the availability of information about other companies within the industry is comparatively limited.

3.3 DATA COLLECTION

In order to provide the most comprehensive view possible, the case study draws upon multiple sources of information. Documentation, archival records, interviews, direct observation, participant observation, and physical artifacts are data sources that are typically used in qualitative case studies (Smith, 2018). A typical case study adopts a comprehensive approach, whereby a large body of mainly qualitative data is collected regarding all aspects related to the case at hand (Van Thiel, 2014). The most important sources in this research are ASML's official press releases and other documents, including position papers and external affairs reports, augmented with (Dutch) new articles and interviews with the board

member of ASML in either newspapers or talk shows. Additionally, official documents and communication from the European Union and additional relevant public documents are collected. In order to increase its digital sovereignty, the European Union has put forward different initiatives, some examples of these most important initiatives are the Joint Declaration on Processors and semiconductor technologies (December 2020), The Alliance for Processors and Semiconductor technologies (July 2021) and the European Chips Act (February 2022). Particularly the official communication and documents regarding the latter will be crucial in the next chapter. All of these initiatives comes with a number of conditions under which the subject has to comply (European Commission, 2021).

During the data collection phase, various attempts have been made in order to arrange interviews with the government relations team of ASML. However, the secretariat of the company informed me that due to a lack of bandwidth it was impossible to organize such interviews. Following, I have tried to get in contact with employees of ASML through personal communication (through a mutual acquaintance and LinkedIn), after which an employee of ASML indicated that the company employs strict policies with regards to interviews, and is reluctant to share information when this is not done through their official channels. The employee added to this that all the information that ASML intends to make public can be found on their official channels.

3.4 OPERATIONALISATION OF VARIABLES

In the previous chapter, different theoretical concepts are discussed that are of central interest to the research. In order to empirically analyse these concepts, they have to be operationalized. According to Van Thiel (2014), it is important to translate the theoretical constructs to concrete indicators. In the following section the concepts will be given unambiguous definitions, and there will be decided which of the facets and elements have been included in the analysis. Lastly, the operationalized variables will include corresponding indicators which can be recognized in the empirical field. In order to capture the behaviour of ASML in tangible terms, the dependent variable is formulated as (non)compliance with regulations. By definition, regulatory rules aim to control the behaviour from businesses, resulting in a specific outcome. One can speak of regulatory compliance when the formal business processes do not violate the formal specifications of a set of normative constraints (Governatori and Sadiq, 2009, as cited in Hasmi et al., 2016). It is of interest to find out what factors have influence on the (non)compliance of European firms with public policy, and additionally if, and how, companies try to circumvent regulations. By analysing this, the behaviour and attitude of private actors regarding the European efforts to obtain strategic autonomy can be detected. The different variables that are analysed are expected to be drivers of (non)compliance.

The first independent variable is the alignment of values and interests between ASML and the public policy. This part of the analysis exists of three steps; first to explore whether ASML has shared certain values or goals. This can for example be found on their website, press releases, or in personal interviews

with board members. Secondly, the researcher has to create a clear vision of the goals of the proposed European policy, in this case the European Chips Act. Finally, the goals and values of both actors can be compared and the assessment on the degree of alignment can be made. Additionally, certain events that preceded the creation of the policy, like coordination between the two parties, can also potentially be relevant. The second variable is the potential reputational costs for firms. According to Truong et al. (2021), reputation is related to financial performance, favourable stakeholder behaviour and customer trust, and purchase intentions. The analysis of this variable can be conducted in a similar manner to the previous one. The researcher can for example investigate whether spokespersons of ASML speak about responsibility in their actions. Important to establish is whether ASML attaches importance to social judgements, norms and expectations, from for example the public or its stakeholders. Thus to seek an answer to whether ASML fears reputational damage. Certain behaviour or activities can also be attributed to a company's pursuit to earn respect from others, like communicating messages that are intended to keep shareholders satisfied. Finally, the researcher can conclude whether reputational costs play a role in the company's compliance with regulations.

Following is the variable of sources of influence and political authority. There are various factors that could indicate to sources of influence. Firstly, the researcher can assess whether the company has certain leverage over the policymakers, this could for example be technological knowledge or valuable partnerships. Moreover, there can be determined whether ASML engages in activities aimed at influencing policymaking, such as lobbying. The researcher can examine the actions taken by the company to exert influence on policy decisions. Lastly, the analysis should include the identification of material resources possessed by the company, such as lobby expenditures, that could facilitate their influence on the policymaking process. The fourth hypothesis speaks of the loss of partners and revenue. In order to examine this, the researcher should look for statements made by the company or spokespersons regarding the consequences of regulations on their financial outlook. When the consequences are predominantly negative, and the company is likely to lose revenue or partners, the expectation is that the chances of noncompliance increase. This concept may be detected when a for example makes statements like 'we do not expect these measures to have a material effect on our financial outlook' (ASML, 2023). The coding scheme that is used as a guideline during the analysis can be found in Appendix A.

4 ANALYSIS

The following chapter will give a description of the collected data and presents the findings. The chapter will start with an introductory section that provides context into the dynamics of the semiconductor industry, the history and distinctive features of ASML, and the emerging security concerns ASML is faced with. This will be followed by the comprehensive examination of the formulated hypotheses and their analysis. This section will first make the comparison between the values and interests of ASML and those of the EU. Besides this, ASML's reputation and involvement in European policymaking will be covered. The final section of this chapter examines the potential effects of (export) regulations on the company's financial outlook, and the corresponding reaction to these effects.

4.1 THE SEMICONDUCTOR INDUSTRY IN THE DIGITAL ECONOMY

The semiconductor industry holds a central role in the digital economy, as various sectors are reliant on digital technology. However, factors like chip shortage, public incentives and technology trends are changing the semiconductor global value chain. In their working paper, Cian and Nardo (2022) have divided the supply chain for the production of semiconductors into different stages. The chain starts with the research and design stage. In this stage, companies and other entities are actively innovating and developing new technologies regarding the manufacturing of chips. Higher up in the chain is the production of the chips itself, which is a highly capital-intensive activity and is therefore concentrated around a limited number of players at the global level. Players in this stage are the firms that manufacture the chips; the *fabless* companies, but also the suppliers of the semiconductor manufacturing equipment, the and the suppliers of raw materials: the *foundries*. In the last stage of the production chain the chips are being assembled, tested and prepacked. Big tech companies like Intel and Samsung distribute design, manufacturing, assembly, testing and packaging around the world. To illustrate the diversity of the supply chain: more than half of the suppliers of American firms are located outside the US (Segal, 2021). Contrary to the other stages, this stage is more labour intensive than capital intensive (Cian & Nardo, 2022).

According to Nauta, Professor Electrical Engineering, the chip sector itself is well-balanced (as cited in Giesen, 2022). Chips are designed in America by companies like Apple and Qualcomm and manufactured in Asia using European machines, mostly the manufacturing equipment from ASML. However, due to the complexity of the global supply chain, the semiconductor ecosystem has been at the heart of geopolitical tensions between several countries, including the US, China and Taiwan (Crawfort et al., 2021). The Taiwanese semiconductor company TSMC for example supplies the world leading tech companies, including Apple and Huawei. The US had tried to exploit its position in the embedded network to gain leverage over China; with the tightening of a critical choke point as the main policy goal. Where the United States has firm control over the most advanced chip technologies, including semiconductor manufacturing equipment, is the European Union a net exporter of machines

for the production of semiconductors, where most of these machines are exported to the countries with a leading position in chip production: China, Taiwan and Korea (Cian & Nardo, 2022; Segal, 2021). This is mostly due to the fact that some European manufacturers, like ASML, have gained a leading position in the field over the last decade (Cian & Nardo, 2022).

In her strategic report, the European Commission (2021) has indicated that given the exponential increase in demand for semiconductors, the EU must assert a stronger position in the development and production of next-generation technologies. Shortages of semiconductors could lead to severe disruptions in various industries. Recently, Europe has already been experiencing chip shortages. Supply chain issues caused by COVID-19 have caused shortage in various chips. The consequences of the scarcity have been widespread: it has had impact on various consumer devices, datacentres, transportation and healthcare sectors (Bish et al., 2022). ASML's CEO Peter Wennink has compared the current chip shortage with the oil crisis in 1973: due to scarcity oil became a strategic commodity, and the same has happened with semiconductors (Hijink, 2021; Witteman, 2023).

The Commission also mentions that the EU has notable strengths and hosts a crucial supplier of manufacturing equipment for leading manufacturers, however, is lagging behind in the production of advanced semiconductors. Countries such as Taiwan, China, South Korea and the USA are boosting their domestic semiconductor production and have announced massive private investments. The EC (2021) indicates that if the EU wants to remain competitive, they have to invest in their capabilities in the production of semiconductors, including increased investment in Research and Development (R&D) and favourable conditions across the entire value chain. In 2022, the EC has officially announced a new initiative, the European Chips Act, which aims to decrease European dependence in the semiconductor industry and strengthen Europe's technological leadership (European Commission, 2022a; Poutala et al., 2022). The goal of this act is to double Europe's market share in the global value chain by 2030. The EU has been supporting the sector through research programmes, however intends to implement a comprehensive set of action and financing schemes, and additionally, a closer collaboration of supply and demand side actors (European Commission, 2022a).

4.2 ASML IN A NUTSHELL

In 1984, ASML was created by the Dutch multinational electronics company Philips and chip-machine manufacturer Advanced Semiconductor Materials International (ASMI) to develop lithography systems for the growing semiconductor market. Both companies scaled their investments, with a focus on R&D, to help make ASML a success (ASML, 2019a). The goal of the founders was to develop a fast and accurate chip-making machine that could effectively compete in the growing semiconductor industry. One year after the creation the office and factory moved from Eindhoven to Veldhoven, just a few kilometres away. Initially, the company lagged behind its competitors in terms of both quality and cost (Tung & Wan, 2023). As of 1990, ASML's market share was less than ten percent, while competing

companies like Canon and Nikon had a dominant position – between 70 percent to 75 percent of the market share. In 1992, there even were concerns about ASML facing a potential closure (Tung & Wan, 2023). Because of a strong competitive market, ASML was lacking self-sufficiency and depended on the funds provided by Philips. These funds have helped the company to become profitable; in 1995 it became a fully independent public company (ASML, 2019a). During the following years, ASML would make road-ins in the Asian market, after establishing a joint-venture foundry in Taiwan. Additionally, the new chip-machine manufacturer was expanding its employees and locations in the United States. In 2010, the beginning of a new era was marked when ASML shipped the first prototype Extreme Ultraviolet (EUV) lithography tool to an Asian chipmaker. EUV lithography utilizes shorter-wavelength light to create smaller chip features, leading to the production of faster and more powerful chips (ASML, 2019a). This breakthrough eventually marginalised the rivals and former market leaders Nikon and Canon (Tung & Wan, 2023).

ASML only sells its machines to five chipmakers (Tarasov, 2022). The three most important customers of ASML are Intel (United States), Samsung (South-Korea) and TSMC (Taiwan), who produce semiconductors which are used in datacentres, autos, smartphones and many other devices used all over the world (Tung & Wan, 2023). These three companies made 84 percent of ASML's business in 2021 (Tarasov, 2021). Around a decade later, in the beginning of 2020, the Veldhoven based company has shipped its 100th EUV system and has moved into high volume manufacturing. In 2023, ASML employs more than 32,000 people (FTE) at 60 locations around the globe. Chief Executive Officer (CEO) Peter Wennink, Chief Technology Officer (CTO) Martin van den Brink and Chief Financial Officer (CFO) together set the direction for ASML (ASML, 2022a). With a market value of 129 billion euros, ASML has the 38th position in the global list of the most valuable companies, surpassing giants like McDonalds, Unilever, Shell, Walt Disney or Nike. However, because consumers themselves hardly ever come into contact with their lithography machines, ASML is less known to the general public than the aforementioned companies (Witteaman, 2022a).

CTO Van den Brink emphasizes that ASML hardly makes anything themselves; the company outsources the construction of components and delegates significant responsibilities to their partners. ASML exclusively assembles the individual modules into a lithography machine (Hijink, 2021). One EUV machine consists of more than 457,000 components sources from all over the world (Witteaman, 2023). ASML's supplier network consists of around 5000 suppliers (ASML, 2019e). Its partnerships are long-term and mutual beneficial, and one of its most important partnerships is with Carl Zeiss SMT (ASML, 2019e). This German lens manufacturer has been partners with the Dutch chip-machine manufacturer since 1986, and the partnership runs according to the principle of 'two companies, one business', meaning that ASML holds an interest in Carl Zeiss SMT (ASML, 2019d).

The company culture of ASML is centred around three core values: *challenge*, *collaborate* and *care*. The first core value, *challenge*, encompasses the challenging of boundaries and the aim to improve ideas and processes. Secondly, ASML collaborates with an ‘ecosystem of customers, partners and stakeholders’, in order to harness the collective potential, plus to share and expand knowledge and skills (ASML, 2019b). This is what the company imposes with *collaborate* as its value. Lastly, the value of *care* entails ASML’s responsibility as a market leader. On this matter the company states the following (ASML, 2019b): ‘As an industry leader, we act with integrity and respect, realizing that our impact extends beyond technology to people, society and the planet. We take personal responsibility to create a safe, inclusive and trusting environment where people from all backgrounds are encouraged and enabled to speak up, contribute, make mistakes, learn and grow.’ ASML places a high level of importance on research and development. As they mention themselves: ‘Without R&D, ASML wouldn’t exist.’ (ASML, 2019c). Maintaining the current pace of innovation is crucial in conducting a successful business; the global demand for microchips is growing and therefore chipmaking systems that produce smaller, faster, cheaper, more powerful and energy-efficient microchips are needed.

The development of new technologies is done in close collaboration with partners, inside and outside ASML. Collaborations with research institutes such as universities and research institutions is therefore of great importance. In 2023, ASML announced that they would strengthen the collaboration with Eindhoven University of Technology (TU/e), which includes for example a jointly defined research program with the construction of a new ASML research facility on the university campus (ASML, 2023b). ASML refers to its long-term relationships with its partners as an ‘innovation ecosystem based on trust’: they share the risks and rewards, listen to each other and push each other to keep innovating (ASML, 2019d). In essence, ASML is a collaborative innovation network which consists of large companies, small- and medium-sized enterprises, and applied research organisations.

4.3 SECURITY ISSUES FOR ASML

In recent years ASML has been subjected to certain security risks. In 2015, former employees took company secrets and sold it to Xtal Incorporated, an American company which is funded by entities in South Korea and China (Reuters, 2019). According to a regional newspaper, Dagblad Eindhoven, some of the employees had a Chinese background and along with the co-financing from Chinese sources, a connection with the Chinese government was made. As a result, Dutch politics started to be more concerned about security risks, which led to better protection of high-tech technology against China. At this time, ASML itself denies the connection between the data theft and the Chinese government (Verrijt, 2019). A couple of years later, ASML is again a victim of data theft. In its 2022 Annual Report, one of the risks for the company is described as ‘failure to adequately protect intellectual property, trade secrets or other proprietary information could harm our business’ (ASML, 2022b, p.58). In this section, they indicate that they have experienced theft of intellectual property. In February 2023, a spokesperson of

ASML informs Dutch news outlet NOS that the incident recently happened and that it again concerns a former employee (NOS, 2023b). The company acknowledges the increasing security risks due to the growing geopolitical tensions. ASML had to report the incident to the authorities in both the Netherlands and the US, due to the possible violation of certain export controls (NOS, 2023b).

The initiation of these export measures started in 2018, when the Trump administration launched a campaign to block the sale of ASML's chip-manufacturing technology to China. The trigger for this campaign was a license that was granted to ASML by the Dutch government to sell its most advanced machine – the EUV machines – to a Chinese customer. The campaign worked, and the Dutch administration decided not to renew ASML's export license; the machine eventually was never shipped (Alper et al., 2020). According to American officials the dual-use principle was applicable, meaning that using the most advanced systems, one could produce the most advanced chips and these could potentially be used for highly advanced weapon systems (Van der Lugt & Van der Putten, 2022). In 2022, the US government advocated that besides the EUV-systems, the export restrictions should be extended to also the DUV-systems. This is one of ASML's older machine types. Accordingly, in March 2023, the Dutch government imposed these more stringent export regulations on ASML (Van Bekkum, 2023).

According to Okano-Heijmans (2023b), the tendency of protectionism is increasing in the US, not only under the Trump administration, but also under Biden's administration. In January 2023, the prime minister of the Netherlands, Mark Rutte, met with US President Joe Biden in Washington, potentially discussing more export restrictions (Alper et al., 2020). America demands support from Europe in its growing rivalry with China, and as a result ASML is being pressured into these export restrictions. The dependency of Europe on the US in terms of security makes it hard for the EU to determine its own position in this conflict. Meanwhile, it seems that China itself is trying to become more autonomous in the semiconductor industry. Prominent researcher in the field of semiconductors, Jan-Peter Kleinhans, indicates that a credible rumour is that the largest chip manufacturer in China, YMTC, is trying to figure out the cost of fully 'de-Americanizing' the company's supply chain (Pinster, 2021). Okano-Heijmans (2023b) emphasizes that decoupling from China is costly for Europe, as it is a large sales market, production location and innovative market for Dutch and European companies. She indicates that interconnectedness and mutual dependence will persist, and the EU has to navigate between the clashing political and economic systems of China and the US.

4.4 ALIGNMENT OF VALUES AND INTERESTS: THE EUROPEAN CHIPS ACT

The first hypothesis claims that when the values and interests of both parties are aligned, sincere cooperation is more likely. The following section will discuss to what degree the values and interests of the European Union and ASML are aligned with regard to the European Chips Act. The initiative of a new European strategy for the global semiconductor industry – the European Chips Act – was officially

announced in Von der Leyen's speech on the 15th of September in 2021. Before the official proposal was published by the European Commission in 2022, a few things preceded. In March 2021, the Commission launched a 10-year plan, the Digital Compass 2030, setting their goal on a 20 percent global semiconductor market share for the European Union and establishing a 'megafab' – a fabrication plant capable of producing highly advanced 2-nanometer chips (Busvine, 2021). These targets were set out by European internal market chief Thierry Breton, who during this time organized meetings with the CEOs of Intel, TSMC and ASML about the creation of a semiconductor alliance in order to achieve these targets (EURACTIV, 2021).

According to semiconductor expert Kleinhans, the goal of the EC to increase the EU's market share from 8 percent to 20 percent within ten years is 'in no way realistic' (Pinster, 2021). The inclusion of this goal in the Commission's vision paper shows, according to Kleinhans, that policymakers in Brussels and in some EU member states do not understand how the market works. ASML's CEO also criticized these goals, and especially the plan for the creation of a major advanced fabrication plant was firmly opposed (De Ingenieur, 2021; Monterie, 2021). In April 2021, during a webinar hosted by the FME – the employers' organization for the technology industry – Wennink indicated that the investments for setting up such a fabrication plant are too high for the EU, and the supply chain that is required to make such a state-of-the-art factory successful is lacking (Monterie, 2021). Wennink said in an interview that: 'Wanting to build a factory for 2-nanometer chips in Europe is the same as saying you want to build a rocket to send people to the moon' (Cerulus, 2021). He concluded that it doesn't make sense for the EU to establish heavy subsidies and that attaining sovereignty in this area is impossible; only in South-Korea, Taiwan and the US the establishment of such factories has been successful (Monterie, 2021). Instead, Wennink advocated for investments in mature manufacturing capacity, meaning establishing factories dedicated to the fabrication of older generations of chips (Cerulus, 2021).

Following, in May 2021, Commissioner Breton had a meeting with ASML at the headquarters in Veldhoven (Sterling, 2021). After this meeting, Breton stated that the EU is ready to commit to the goals of doubling its share of the global semiconductor production and reshoring the production of the most advanced chips by 2030, thus the same goals as formulated in the Digital Compass. This time, Wennink didn't openly oppose these plans, instead he said that it made sense for Europe to support research and infrastructure development in industry sectors that will hold significance in the next five years (Sterling, 2021). According to Nauta (as cited in De Ingenieur, 2021), this moment has been a turnaround for ASML. Where Wennink previously warned against the undesirability of the establishment of a new fabrication plant for advanced microchips in Europe, he now approves the plans of Breton. Spokesperson of ASML, Monique Mols, denies that ASML has made a major shift. She indicates that Wennink consistently emphasized that the creation of an advanced chip factory by inexperienced newcomers is unlikely to be successful. However, when established and experienced players are involved, ASML fully supports this. The established players she refers to are chip-manufacturers such as Intel, Samsung and

TSMC (De Ingenieur, 2021). Considering that these three companies are ASML's most important customers, this could be an explanation for the fact that ASML is in favour of the creation of new fabs by these companies.

In a reaction to the proposed initiatives during the State of the Union, the Dutch government published a preliminary position paper reflecting critically on the initiative of the European Chips Act in October 2021. In this paper, the Dutch administration addresses that the Netherlands is deeply integrated in the European semiconductor value chain because of the unique position of certain Dutch companies in the semiconductor industry, referring to ASML, ASMI, NXP and Besi. She pleads for an open market, rather than European decoupling: 'The Netherlands knows that the European value chain profits from open markets, global supply chains, and strong cross border ties between research and industry, with research institutes TNO and IMEC as leading examples' (Ministerie van Buitenlandse Zaken, 2021, p.1). During this period, ASML didn't publicly respond to the proposed initiative, but it is plausible that the Dutch government advocated for the interests of the Dutch chip-machine maker with respect to this matter. In November 2021, the headquarter in Veldhoven was again visited in preparation of the final proposal, this time by EC president Von der Leyen, together with European Commissioners Margarethe Vestager and Thierry Breton. During the visit, Von der Leyen declared that ASML will play a significant role in making the European tech sector more competitive and independent (Hijink, 2021).

Following the visit, upon request from Brussels, ASML delivers a white paper including a long-term plan for the European chips sector and the Chips Act (Hijink, 2021). The final proposal for a European Chips Act was published the 8th of February in 2022 (European Commission, 2022b). This same day, ASML publishes its position paper on this matter (ASML, 2022c). Accordingly, the final proposed Chips Act and ASML's position bear a great resemblance. In its position paper, ASML (2022c) indicates that it strongly welcomes the European Chips Act, with its ambition to more than double the EU's global market share by 2030.

However, ASML emphasizes that the Chips Act should not only focus on increasing Europe's chip production capacity, but should aim to double Europe's relevance in the global semiconductor industry. Because of the complexity of the semiconductor supply chain, creating a self-sufficient semiconductor value chain would be virtually impossible – and unnecessary: as long as other countries keep relying on European products and technologies, Europe's position in the global semiconductor ecosystem will be strengthened (ASML, 2022c). The Dutch chip-machine manufacturer thus places great emphasis on the preservation of the current global supply chain. In May 2023, Commissioner Breton mentions in a speech at the IMEC Technology Forum that: 'This is not about closing Europe or doing everything here in Europe. This is about developing an industrial policy to manage our dependencies and create the necessary leverages to defend our strategic assets' (Breton, 2023). Both parties agree on the need to create European leverage over other countries, without decoupling Europe from the supply chain.

However, in the same speech Breton refers to China as EU's systemic rival (Breton, 2023). On this matter the two parties don't seem to be aligned, as ASML's position paper highlights the importance of open borders and free trade, by addressing that China is a key chip supplier to European industries (ASML, 2022c).

ASML asks for significant public funds and attracting large private investments from both within and outside the EU. Wennink has said in an interview that he supports this form of protectionism: he believes that there nothing is wrong with considering the society as an investor in a company. ASML is for example already experiencing significant tax advantage due to the Dutch intellectual property box (Bollen, 2018). The reasoning ASML uses for asking for extensive investments is that the current lack of advanced chip manufacturing experience on European soil increases the complexity, costs and related investment risks (ASML, 2022c). The previously contested idea of reshoring semiconductor production to within the borders of the European Union is also addressed in the policy statement. As ASML's spokesperson already mentioned, ASML is in favour of setting up advanced semiconductor fabs in Europe by teaming up with Intel, Samsung and TSMC (ASML, 2022c). It mentions that Europe needs to strongly incentivize foreign investments to mitigate the risks that arise with building new fabs and to prevent that these fabs will be built elsewhere.

Additionally, the company emphasizes the need for a long-term semiconductor innovation roadmap, defined by the European semiconductor alliance; which should consist of the manufacturers, customers, research organizations and policymakers. ASML makes the following comment about access to the alliance: 'for alliance membership, European presence and investment should be applied as the guiding principle, rather than the corporate headquarter location (ASML, 2022c, p. 9). This implies that ASML would be open to granting access to the alliance for entities that are not based in the Europe. Plausible candidates that ASML could refer to would be Intel, Samsung and TSMC, all of which have their headquarters located outside the EU.

In the proposal of the Commission, various general strategic objectives are presented (European Commission, 2022b). The Chips Act will mobilize more than 43 billion euros of public and private investments (European Commission, 2022a). ASML presents different plans that should be part of an, what they call, 'innovation roadmap to guide investment decisions' (ASML, 2022c, p.2). Overall, the objectives as formulated in the Commission's proposal and the plans of ASML as presented in its position paper are similar. Table 1 outlines the corresponding objectives in the Commission's proposal and ASML's position paper.

Table 1.*Shared objectives by the European Commission and ASML.*

<i>Research and technology</i>	
The objective of the Commission is that Europe should strengthen its research and technology leadership.	The plan of ASML is to upgrade the existing research facilities that are dedicated to European semiconductor process technology.
<i>Increase EU's capacity</i>	
The objective of the Commission is that Europe should build and reinforce its own capacity to innovate in the design, manufacturing and packaging of advanced chips, and turn them into commercial products.	The plan ASML presents is maximizing the potential of European champions in semiconductor design, manufacturing equipment and materials.
<i>Improve EU's global position</i>	
The objective of the Commission is to put in place an adequate framework to increase its production capacity by 2030.	ASML's plan is to invest in the European semiconductor ecosystem to boost Europe's industrial positions in global end-markets, and to invest in both mature and advanced semiconductor production in Europe.
<i>Understanding of semiconductor industry</i>	
The Commission wants to develop an in-depth understanding of global semiconductor supply chains.	ASML wants to create a semiconductor strategy (roadmap) defined by European end users together with representatives of various parts of the semiconductor value chain in Europe.
<i>Attract investors</i>	
The Commission wants to create a more investor-friendly framework for establishing manufacturing facilities in Europe.	ASML's supports plans to attract industry frontrunners to build advanced factories in Europe.
<i>Attract talent</i>	
The Commission wants to address the acute skills shortage, attract new talent and support the emergence of a skilled workforce.	ASML prioritizes the funding of technology and research facilities, as this should lead to innovation spills-overs and talent attraction.

Concluding, due to the meetings between the Commission and ASML it seems that there has been some coordination prior to the official proposal for the European Chips Act. Especially considering that ASML has potentially changed its standpoint regarding the creation of a new fabrication plant in Europe, it is possible that some compromises were made during these meetings. However, it is important to mention that due to data limitations it is challenging to prove this. ASML agrees with protectionism to a certain degree, however wants to keep operating in an open market. Throughout the majority of its positions paper, the emphasis of ASML lies on investing in the current European semiconductor ecosystem and European champions, rather than welcoming newcomers to the industry. However, the Commission also proposes support for innovative start-ups, scale-ups, small and medium-sized enterprises (European Commission, 2022b). Additionally, both parties seem to be holding contrasting views on how Europe's relationship with China should be defined.

Overall, it seems that the European Chips Act is in line with the vision of ASML, as the objectives and plans of both parties show many similarities. Additionally, the company's position paper shows its willingness to cooperate with the European Union and the governments of its member states, and stresses the importance of open dialogues: 'In the global semiconductor ecosystem, based on mutual dependencies, a continued open dialogue among the governments of countries active in the semiconductor domain remains vital' (ASML, 2022c, p. 9). In short, the results show that ASML shares the same objectives as the Commission, provided that the implementation thereof serves the interests of ASML itself. Thus, the alignment of interests and values can be considered a motivating driver for compliance.

4.5 REPUTATION AND RESPONSIBILITY

The second hypothesis suggests that when the private actor cares for its reputation, it is more likely to comply with the regulations, as not complying could have negative consequences for its reputation. Several determinants indicate that ASML is actively involved in improving and maintaining the way it is perceived by the public; in other words striving for positive social judgements. An important aspect is that a company like ASML is likely to take into account the norms and values of its stakeholders in its actions. According to Wennink, his company has to balance five groups of stakeholders: the customers, employees, suppliers, partners, shareholders and society (Bollen, 2018). He adds to this that, as the executive of a public company, he functions as a stakeholder manager. With this he implies that ASML embraces a certain stakeholder-model: they do not only work for their shareholders, but also for customers, employees and society (Van Ammelrooy, 2022).

However, DesJardine et al (2022) suggest that in modern society shareholders hold specific privileges that other stakeholders may lack, which gives them the unique position to influence the priorities and practices of corporations. The three most important shareholders of ASML are Capital Research and Management Company (15.81%), Blackrock Inc (7.95%) and Baillie Gifford & Co (4.54%) (ASML,

2022d). The CEO of ASML's second largest shareholder, Blackrock, for example annually urges the company to define its social and sustainability goals and not just to pursue short-term profits (Bollen, 2020). Another example that illustrates that ASML strives to make a good impression on its shareholders can be seen in their quarterly financial statements (Bartjens, 2023). In 2021 and 2022, ASML started to include delayed revenue in their quarterly reports – revenue that cannot be recognized yet but is assured. This deferred revenue was caused by the need for faster shipment of chip-machines due to chip shortages and the COVID-19 pandemic. However, the period after, ASML experienced a significantly lower order intake than in previous quarters. As a result, the quarterly financial reports seem higher than they actually are, as portions of the revenue actually come from previous quarters (Bartjens, 2023). Thus, at first glance, the financial reports may look positive, without directly seeing the effects of the decrease in order intake. It is possible that ASML uses this as a way of reassuring the shareholders that the company doesn't experience a significant decrease in revenue.

Since 2011, ASML is a member of the Responsible Business Alliance (RBA); the biggest international industry coalition that focuses on responsible business conduct in global supply chains (Responsible Business Alliance, 2023). This is the second indicator that ASML cares for its reputation. The RBA Code of Conduct consists of a set of social, environmental and ethical industry standards. This Code includes international norms and standards, encompassing for example human rights and labour standards (RBA, 2022). ASML is a regular member of this alliance, meaning that the member meets all requirements in his category. In order to be a regular member of the RBA, ASML has to report its compliance with the requirements twice a year (RBA, 2022). Besides regular membership, there is one more advanced type of membership: full membership. This membership category entails that the member goes beyond reporting its compliance with the requirements, and demonstrates its fulfilment of the requirements to RBA staff (RBA, 2022). The Dutch manufacturer expects that its network of suppliers also adheres to this behavioural code, as is mentioned on the website (ASML, 2019e): 'We expect key suppliers to participate in this common effort and encourage our suppliers to develop their own sustainability strategies, policies and processes, and actively pursue our suppliers' adherence to this code.'

However, a reoccurring topic of contention is ASML's relations with China; the company still sees China as an important trading partner (ASML, 2022c). Recent years, multiple Western companies have been seeking alternatives to China, also known as friend-shoring. Reasons for this are amongst others, the persecution of Uighurs, the zero-COVID policy and the dictatorship of Xi Jinping (Bouman, 2023). The reason why ASML has not been seeking alternatives for China could be attributed to the fact that the country has consistently been a large sales market. Chinese companies have a high demand for older generation chip-machines, making China one of the largest markets for ASML (Reuters, 2021). In the first quarter of 2022, ASML's sales were largely driven by Chinese demand for DUV-systems; this demand made up 34 percent of the total sales (Van der Lugt & Van der Putten, 2022). Besides this,

China supplies 90 percent of all crucial raw materials for chip production (Hijink, 2022). Having relations with China can cause some reputational damage. In a Dutch newspaper, for example, the company receives criticism of not fulfilling its social responsibility, due to the fact that ASML persists to the idea that China will remain a reliable trading partner for Europe (Bilic, 2023). In this context, it is possible that ASML prioritizes material value over potential reputational costs.

As public awareness increases in social, environmental and humanitarian causes, firms have to communicate their commitment to corporate social responsibility (Dutot et al., 2016). Online channels and companies websites' can provide organizations with opportunities to manage corporations' reputations. Using media can allow the company to enhance and foster relations between them and the public (Dutot et al., 2016). This could also be an explanation for the fact that ASML declined to participate in an interview for this research, as the risk of reputational damage might be too high. However, there is not enough evidence to effectively prove that this was indeed the case. Spokespersons of ASML are regularly interviewed in the media, occasionally addressing the company's responsibility. For example, Peter Wennink told Dutch newspaper NRC (Hijink, 2021) that he wants to look beyond the boundaries of the company, and that he wants ASML to take social responsibility in the region, in the Netherlands and in Europe.

Additionally, ASML uses its website and press releases to communicate initiatives regarding social responsibility. The website for instance addresses that the company has a local engagement programme which consist of the organization and sponsoring of various initiatives and is built around three areas: education, culture and local outreach (ASML, 2019f). One of the presented initiatives is Welcome Online, a digital educational program which helps older people in the region to become digitally self-reliant. In 2021, ASML partnered up with the National Foundation for the Elderly (Nationaal Ouderenfonds), VodafoneZiggo and Samsung to support the digital inclusion of older people. Inge Wouters, manager of community engagement education at ASML, mentions that it is important for ASML to contribute to making the digitalizing society more inclusive and narrowing the digital gap (ASML, 2021a).

These various determinants suggest that ASML is actively involved in improving and maintaining its reputation. Most importantly, the company's inclusion of delayed revenue in its financial reports, membership in the Responsible Business Alliance, and communication through media, its website and other official channels indicate its devotion to reputation management. In its Government & External Affairs Report 2021, ASML also addresses its commitment to complying to laws, regulations and ethical standards, in order to preserve their 'culture of integrity and compliance' (ASML, 2022f, p. 1). Nevertheless, ASML's relations with China remains a topic of contention, as the company continues to do business with the country despite potential reputational costs. To conclude, ASML employs various strategies to ensure shareholder satisfaction and demonstrate its dedication to social responsibility –

which makes it plausible that the company will comply to the regulations in order to avoid reputational costs. Hence, fear of reputational damage can be seen as a driver for compliance.

4.6 ENGAGEMENT WITH EUROPEAN POLICYMAKING

The third hypothesis suggests that when a company holds sources of influence or political authority, the chances of it working against the regulations increase. The following section will discuss whether ASML is involved in political activities like lobbying and agenda- or rule-setting, and if ASML holds certain channels or deterrents that would help them practice influence in the policymaking process. Some of ASML's involvement in European policymaking is already highlighted in the previous section: when the headquarter in Veldhoven was visited multiple times by European Commissioners in preparation of the Chips Act proposal. The Commission's proposal additionally includes a section which points out that there has been a meeting with various CEO's representing the key stakeholders in the European semiconductor industry, hosted by Commissioners Vestager and Breton, and ASML was also present at this meeting. This took place on the 10th of January 2022, and is also known as the 'CEO roundtable on semiconductors' (European Commission, 2022c).

After the second visit in Veldhoven, Brussels made a request to ASML for a white paper, thereby tapping into their expertise. When speaking of sources of influence, the Veldhoven headquartered manufacturer holds one big trump card: their technology. In a Dutch talk show, Wennink (2017) explains that the technology they use in the EUV machines is revolutionary, because these machines contain technology that can only be produced in Europe, particularly in the Netherlands. This has been realised by revolutionary discoveries; no other company in the world is capable of doing this. Because of these ultraviolet light machines, ASML is a monopolist in the field of chip machines. This makes ASML Europe's most valuable tech company (Witteman, 2022b). In an interview in *De Volkskrant*, CEO Wennink indicates that he is surprised with the lack of technological information the political actors possess regarding the semiconductor industry (Van Ammelrooy, 2022). Additionally, because the European Commission wants to establish more manufacturing facilities in Europe, it has also asked ASML for support in attracting chip-giants like Intel, TSMC and Samsung, which are all partners of ASML, to build their new facilities in the EU (Hijink, 2021). The European Union thus seeks to utilize ASML's valuable network. The matter of attracting these chip-giants to building facilities in Europe is also discussed in ASML's position paper on the Chips Act, which acknowledges the importance of teaming up with these industry frontrunners (ASML, 2022c). ASML has been participating in a sequence of meetings with the EC starting October 2020. In total, the company has participated in 19 meetings, where discussions have centred around topics such as technological sovereignty, US export controls, and bolstering semiconductor production capacity and resilience (Joint Transparency Register Secretariat, 2023).

What seems evident in the analysis is that the relationship between the European Union and ASML is growing. According to Wennink, ASML is not playing a regulating role, but rather a consulting role. He compares his company with being an influencer – someone who influences the behaviour of others through social media. He adds to this that Brussels is the one who eventually determines the policy, not ASML (Hijink, 2021). However, some indicators in this analysis point towards regulatory capture – this refers to the situation in which regulated monopolies succeed in manipulating the state agencies that are intended to regulate them (Dal Bó, 2006). The theory of regulatory capture states that firms may attempt to influence regulators through negative incentives, such as explicit or implied threats to reduce the regulator’s utility. One example of such an incentive is the spread of negative rumours about the competence of a regulator. In fact, as mentioned earlier, Wennink pointed out that political actors have an insufficient level of technological understanding regarding the semiconductor industry; thus publicly questioning the competence of the regulators (Van Ammelrooy, 2022).

Moreover, in addition to negative incentives, Dal Bó (2006) indicates that the provision of information can be seen as a form of exerting influence. In the case of ASML, it is likely that the negative incentive provided by Wennink – the rumour that political actors lack technological knowledge – increased the Commission’s need for expertise. In this same interview, Wennink says that he is not surprised that the EC has asked ASML for help, as ‘they play a crucial role in expanding production capacity and developing new chip technology’ (Van Ammelrooy, 2022). Additionally, when collaborating with EU officials, Wennink indicates that his strategy is to avoid engaging in ideological discussions and instead focus on educating them about how the chip industry operates (Hijink, 2021). Another type of incentive firms can provide is ‘open confrontation’, which aims to destabilize the regulators grip on his job (Dal Bó, 2006). It is possible that ASML attempted to exert pressure on regulators when new export restrictions to China were introduced. When the US demanded restrictions on the export of the newest lithography machines to China, Wennink attempted to obstruct this by suggesting that the restrictions will serve as a catalyst for Beijing’s pursuit of greater self-sufficiency (Koc, 2023). His reasoning was that this could ultimately lead to China successfully developing its own technology to produce advanced chip machines: resulting in a loss of control (Bilic, 2023).

ASML also has its own lobby in Brussels since 2021 (Hijink, 2021). Starting from 2019, ASML was already registered in the Transparency Register, a database that lists organisations that try to influence the law-making and policy implementation process of the EU institutions (European Commission, 2022b). The register indicates that the Dutch chip-machine manufacturer represents its own interests and those of its members. Additionally, the Dutch lithography company is involved in a number of associations or networks amongst which are AENEAS Industry Association, European Round Table of Industrialists and BusinessEurope (Joint Transparency Register Secretariat, 2023). In its Government & External Affairs Report, ASML is transparent about its lobbying efforts and goals: ‘We engage in policy influencing to achieve our business objectives and we collaborate with consultancy and advocacy firms

to achieve the following objectives.’ (ASML, 2022f, p. 1). The company states the following objectives: to facilitate the optimization of (R&D) government grants and incentives for the whole value chain, to collaborate with policymakers on key public policy challenges in key markets for ASML, to establish connections with political, governmental stakeholders and industry partners and to educate government officials on ASML, the semiconductor industry and related technologies (ASML, 2022f).

One lobby sector that has been receiving attention is the Big Tech lobby – due to the increase of political power of digital giants. The Corporate Europe Observatory reported on lobbying practices by the digital sector, indicating that big tech companies have been given disproportionate access to policy-makers and their message is amplified through extensive network of think tanks and other third parties (Bank et al., 2021). Despite the fact that ASML itself is not specifically mentioned in this report, is it noteworthy because the report does indicate that Intel, one of ASML’s biggest customers, is one of the ten companies dominating in the tech lobby. The report additionally emphasizes that the Big Tech companies lobby on behalf of their extensive network of lobby groups, consultancies, and law firms (Bank et al., 2021). The top ten companies have an expenditure of over 1.25 million euros annually on lobbying in the EU. ASML has reported in the register that the costs that are associated with its lobbying activities are estimated between three- and four hundred thousand euros per year. However, the Transparency Register has been receiving criticism from pro-transparency campaigners as they indicate that the register remains to contain inaccuracies. Especially the inaccuracy of expenditure in lobbying activities by certain entities draws attention, as there is ambiguity about what should be included in the reported costs: some participants report their worldwide operational costs, while others disclose solely their lobbying expenditures (Nielsen, 2023). Due to data limitations, it is challenging to precisely specify the exact lobbying activities in which ASML is involved, and the overall size of their lobby expenditure.

To conclude, there are various indications that support the hypothesis. Firstly, ASML’s involvement in European policymaking is evident through the various meetings and interactions with the Commission. This suggests that the company has access to policymakers and thus to decision-making processes. Adding to this, ASML holds a significant leverage and bargaining power due to their technology expertise and monopolistic position in the industry. Some of the indicators even point towards a certain degree of regulatory capture; it seems that ASML made some attempts to provide some negative incentives towards policymakers aimed at influencing them. However, to effectively verify that there is an occurrence of regulatory capture requires further investigation in this matter. Lastly, ASML’s lobbying efforts are formally documented in the Transparency Register, however there are some uncertainties as to how accurate the reported information is within this register. In short, ASML does hold certain sources of influence which they can leverage over policymakers – this makes the expectation that the company will attempt to work against unwanted regulations plausible. Therefore, holding sources of influence over the state can fuel noncompliance.

4.7 THE MATERIAL EFFECTS OF RESTRICTIONS

The following section will discuss the results of the fourth hypothesis; this hypothesis posits that the loss of partners and benefits in consequence of the regulations will create incentives for the firm to disregard or circumvent them. As mentioned in the previous sections, ASML is the most valuable tech company of Europe. In 2022, the company recorded a profit of 5.6 billion euros, with a revenue of 21.2 billion euros (Wieringa, 2023). In an interview with NRC, chairman Wennink indicates that 2022 was a challenging year due to a fire in a factory in January, along with ongoing COVID-19 measures and the war in Ukraine. He also mentions that new risks may arise in the upcoming years, referring to inflation, rising interest rates, the possibility of a recession, and geopolitical developments regarding export restrictions (Wieringa, 2023). The latter will be further discussed in the following section.

As previously discussed in this chapter, there has been restrictions on the export of EUV-machines to China from 2019. However in March 2023, the Dutch government decided, under pressure from the United States, that ASML should also stop exporting older chip machines to China (Van Bekkum, 2023). One-fifth of the planned orders is Chinese, and it is possible that restrictions will have a negative impact on the operating income and stock price of ASML (Bilic, 2023). However, Roger Dassen, CFO of ASML, claims that losing China as a market share won't cause a financial problem for ASML in the short term. According to him, there are still plenty of customers in line (Bronzwaer, 2023). In a statement regarding the export controls, ASML (2023a) declares that: 'Based on today's announcement, our expectation of the Dutch government's licensing policy, and the current market situation, we do not expect these measures to have a material effect on our financial outlook that we have published for 2023 or for our longer-term scenarios as announced during our Investor Day in November last year.'

Conversely, in the first quarter of 2023, the company has been seeing a dip in sales to mainland China (Reuters, 2023). CFO Dassen (2023) indicates in an interview about ASML's financial results that China accounted for 8 percent of system sales, but that China accounts for 20 percent of their backlog. By meaning of this, he suggests that ASML expects a significant increase in sales to mainland China in the upcoming quarters. He adds to this that ASML is still waiting for the detailed guidance from the Dutch authorities regarding the export controls. However, CEO Wennink conveys a rather different message during a presentation of ASML's annual financial results, where he mentions supply issues and chip shortages as possible negative consequences of export bans (Schwartz, 2023). In this presentation, Wennink points out that threats to their supply chain could have severe consequences for the company and for the semiconductor ecosystem as a whole. He emphasizes the fact that the current semiconductor ecosystem has driven remarkable technological progress in the chip industry, and the introduction of multiple locks in that system could have repercussions, and eventually result in decreased efficiency.

Ultimately, it is challenging to determine what effect the export restrictions will have on ASML's financial outlook. On the one hand, China made up 34 percent of its total sales due to the high demand

for DUV-systems, and the loss of China as a sales market could significantly decrease the financial results (Bilic, 2023; Van der Lugt & Van der Putten, 2022). On the other hand, export restrictions might not be a critical issue for the company: the risks don't seem to outweigh the demand for the lithography machines. ASML is currently unable to fulfil the orders on its books, which are worth nearly 39 billion euros (Van Bekkum, 2023). Additionally, ASML can compensate for not selling its advanced machines to China by utilizing other trade opportunities with the country, such as maintenance and repairs of existing machines, training, and sales of less advanced chip machines (Bilic, 2023). Although the announced export restrictions are Dutch national policy, the European Union is likely to follow with implementing their own new defensive instruments through which investments in China can be prohibited. According to Giesen (2023) Commission President von der Leyen disclosed that the EU will be presenting an economic security strategy, as part of OSA, later in 2023. Reacting specifically to the Dutch export controls resulting out of US demands, Von der Leyen added that in the future there should be clear European rules for such cases (Giesen, 2023).

That being said, the European Chips Act as proposed, doesn't prioritize export restrictions, but rather focuses on investing in capacity building in the semiconductor industry. As previously noted, the Chips Act in total mobilises more than 43 billion euros of public and private investments (European Commission, 2022a). Although there is some disagreement as to the magnitude of the effects, it is widely acknowledged that public investments have a positive effect on private sector performance in terms of employment, investment and private output (Pereira & Andraz, 2003). Increasing public investment can boost private sector output and employment ((Petrović et al., 2021). Therefore, there is a strong likelihood that ASML will experience financial benefits as a result of the regulations, as the main objective of the investments is to create a thriving semiconductor sector (European Commission, 2022a).

In conclusion, there is uncertainty about the exact effect of export restrictions on ASML's financial outlook. Given that China accounts for a substantial portion of the company's sale, the loss of this country as a sales market could have a significant negative impact on ASML's given results, which ultimately increases the possibility of noncompliance. On the other hand, as the CFO of ASML indicated, the company should be able to compensate for the loss through other trade opportunities, primarily due to the high demand for lithography machines. Furthermore, the Chips Act prioritizes investing in the industry, which is likely to have a positive effect on ASML's financial outlook. Therefore, based on the available information, there is a strong possibility that the company will experience positive effects on their financial results as a result of the regulations. However, this forecast could change when the Dutch export restrictions are finalized, or when the European Union includes additional export restrictions for ASML in its economic security strategy. Due to the uncertainties regarding this matter, it cannot be determined that material effects play a role in ASML's (non)compliance.

5 CONCLUSION AND DISCUSSION

The focus of this thesis was to examine how a specific private actor, Dutch chip-machine manufacturer ASML, would respond to the initiatives proposed by the European Union in the pursuit of strategic autonomy, in order to answer the corresponding research question: *“What factors influence the (non)compliance of Dutch chip-machine manufacturer ASML with the regulations proposed by the European Union in the pursuit of Open Strategic Autonomy?”*. The aim of this research was to gain insights in the role of private actors within the framework of weaponized interdependence. To achieve these insights, an in-depth case study is conducted considering various drivers of (non)compliance: alignment of values and interests, reputational costs, holding sources of influence over public authorities and the loss of partners and benefits.

The analysis reveals there has been some coordination between the European Commission and ASML preceding the European Chips Act proposal, evidenced by the fact that there has been multiple meetings between the two parties during this period. Overall, the objectives of the EC and the plans of ASML show many similarities. What is noticeable, is ASML’s significant emphasis on investing in the existing European semiconductor ecosystem and supporting European champions, rather than embracing newcomers. This strongly implies that the company prioritizes its own interests. Additionally, the parties seem to be holding contrasting views on how Europe’s relationship with China should be defined. Nonetheless, shows ASML willingness to cooperate with the European Union, as the final proposed regulations align with its interests and values. Therefore, the alignment of interests and values can be considered a motivating factor for compliance. This also applies to the fear for reputational damage, as the analysis has shown that ASML employs various strategies to ensure shareholder satisfaction, and to demonstrate its dedication to social responsibility. The company’s public communication emphasizes its commitment to complying to laws, regulations and ethical standards, as a means to uphold and preserve its corporate culture. Thus, this factor can also serve as a driver for compliance.

Furthermore, ASML’s involvement in European policymaking becomes apparent in the analysis, as becomes clear from the numerous meetings and interactions the company had with the Commission. This demonstrates the company’s access to policymakers and decision-making processes. Two factors provide ASML significant leverage and bargaining power over policymakers: its technological expertise and its extensive network. Some indicators even point towards a situation of regulatory capture – when the company is able to manipulate public authorities. ASML’s ability to leverage its sources of influence over policymakers provides a basis for challenging regulations; consequently fuelling noncompliance. For the final hypothesis, it was challenging to come to a definitive conclusion, due to the higher level of uncertainty surrounding this aspect. Nevertheless, the analysis of this factor provided some interesting insights. Because the EU Chips Act is mainly focused on investing in the industry, the regulations are likely to have a positive effect on ASML’s financial outlook. However, this situation might change if

certain export restrictions were to be implemented. Dutch export restrictions are announced – but have to be finalized. Overall, the influence of material effects on ASML’s (non)compliance cannot be definitively determined. To conclude, this implies that three of the four expected factors – alignment of values and interests, fear for reputational damage and holding sources of influence over public authorities – hold a relation with ASML’s (non)compliance with EU regulations in the pursuit of OSA. The evidence found regarding the last hypothesis showed many contradictions, which made it difficult to draw a definitive conclusion. One possible explanation for this ambiguity is that the regulations that supposedly have the most impact on ASML’s financial outlook – the export restrictions to China – are not finalized yet, or in the case of the European Union, not even officially initiated yet. Thus, the claims ASML makes about the expected material effects of export restrictions are rather presumptions. Additionally, the precise financial impact that will result from the EU Chips Act for ASML remains unclear.

In the original theory of weaponized interdependence, as formulated by Farrell and Newman (2019), private actors are acknowledged to play crucial roles in the transactions that take place in the global economic networks, however are not provided real agency. Rather, they are depicted as passive actors that convey to government policy. The framework of WI rested on the theoretical bases about the alignment between state and companies, leaving empirical validation underdeveloped. This research has sought to provide such empirical validation – or rather, invalidation. This study thus considered the circumstances under which the assumption of firms being passive transmitters of government policy is violated. Where Gjesvik (2023) previously concluded that states have a harder time in regulating reluctant private actors, these results give more insights in what conditions might lead to the reluctance of these private actors. Additionally, these insights represent a valuable addition to the management literature regarding the behaviour of business and the dynamics of the public-private relationship.

The concept of OSA, and the European Chips Act, resulted out of growing concerns by European policymakers about the geopolitical tensions on the world stage, triggered by the technical competition between the US and China. Where interconnectedness and interdependence has long been prevalent as a valuable asset for the global community, this initiative was aimed at decreasing such dependencies. The notion of digital sovereignty emerged to promote European leadership and autonomy in the field, by means of ensuring European fundamental rights and values (Von der Leyen, 2020). In order to make this pursuit for strategic autonomy successful, collaboration with the private actors that operate within the digital sector is said to be crucial (Mattlin et al., 2022). This research helped to explore the factors that can influence the behaviour of private actors regarding public policy, thus examining the public-private relationship. The results shed light on the circumstances that enhance the likelihood of successful and genuine cooperation between ASML and the European Commission. To conclude, the implications of these results are twofold. Firstly, these insights enhance the understanding of the role of private actors

in the context of weaponized interdependence. Secondly, this study sheds light on the conditions that make sincere and successful cooperation between private actors and public authorities possible.

One limitation of this research relates to the availability of data sources. This study solely rested on public documents from both the EU and ASML, and secondary sources like interviews found in the media and online, information and insights provided by journalists or experts in the field. Although both parties publish numerous official statements and documents, it is not possible to discover what happens behind closed doors. For example, during the formulation phase of the proposal, it seemed that ASML has changed its standpoint regarding the creation of a new fabrication plant in Europe right after the Commission's visit to the company's headquarter, which suggests the likelihood of certain compromises being made. However, the content of the discussions during these meetings between the Commissioners and ASML has not been disclosed to the public, therefore this perception remains speculative. As previously mentioned, different attempts were made to arrange interviews with employees from ASML, however the company showed to be reluctant in sharing information about such (political) matters. Conducting interviews and gaining personal experiences and viewpoints from ASML employees could have provided additional perceptions to this study.

Another limitation of this research related to the selected methodology. Conducting a single case study about ASML provided an opportunity for a thorough and extensive analysis, allowing for a deeper understanding of the case; and decreasing the possibility of overlooking uniqueness and complexity. However, there are a few constraints associated with this research design. Firstly, it is harder to generalize the findings to a larger set of units. ASML is a unique case, mainly because of the fact that the company is a monopolist in its field. The company possesses various distinctive features which makes it a very interesting case. However, these unique characteristics also pose challenges in formulating overarching conclusions that can be universally applied to the other entities in the semiconductor industry. One way to solve this, would be to conduct a comparative case study and see whether there are differences between ASML's results and that of another European company, or even multiple companies in the semiconductor industry. One intriguing case that stands out for comparison is Dutch chip-manufacturer NXP. This company is, just like ASML, a prominent player in the global chip industry, and also based in the Netherlands, Eindhoven (NOS, 2023c). Examining NXP's features and behaviour in contrast to ASML would provide new valuable insights and could contribute to a comprehensive analysis, eventually leading to results that can be applied more broadly.

Additionally to the aforementioned suggestion, due to the uncertainty regarding the financial impact of the EU Chips Act for ASML, another suggestion for future research is to reexamine this case after the new export restrictions have been implemented, in order to effectively assess the impact of stringent export controls on ASML's revenue. In addition, the case could be re-examined the period after the official implementation of the European Chips Act. This could give broader insights in how successful

the collaboration between ASML and the European policymakers actually is. The results from this case study can thus be compared with the results from a case study which is conducted after the implementation and enforcement of the policy. Lastly, the relationship between ASML and the European Commission is, logically, a highly discussed and reoccurring topic in this research. Some indicators in this case pointed towards a situation of regulatory capture, however, due to data- limitations and time constraints, there was not enough evidence available to effectively confirm this. In fact, it could be of interest to explore whether there is an occurrence of regulatory capture between the European Commission and ASML – and possibly other big players in the semiconductor industry.

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APPENDIX

Appendix A: Coding Scheme

Coding scheme (non)compliance of private actors.

Result	Concept	Indicator
Compliance	Alignment of preferences	<ul style="list-style-type: none"> - individual alignment - organizational alignment - worldview - values - interests and goals
	Loss of reputation	<ul style="list-style-type: none"> - responsibility in actions - strive for respect of others - care for social judgements, social norms and expectations
Noncompliance	Sources of influence / political authority	<ul style="list-style-type: none"> - lobbying / campaign finance - material resources - agenda- and rule-setting - framing of public debate or political actors - withholding knowledge on complex technological information
	Loss of revenue	<ul style="list-style-type: none"> - economic barriers for conducting business - profit-maximising - loss of profit - loss of partners