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Export Restrictions in the Field of Artificial Intelligence and Quantum Computing: Justification and Risks – The United States–China Rivalry from a European Union Perspective**

ABSTRACT: The study aims to elicit the problems posed under international law and, to a lesser extent, under European Union (EU) law by export controls imposed on foundational transformative technologies such as artificial intelligence and quantum information technology in the relations between United States and People's Republic of China. It examines the notion of export controls and its evaluation under international law, finding that such an evaluation of the legal nature of these measures remains unclear on not only whether these measures may constitute economic coercion but also whether such coercion is prohibited. Further uncertainty persists regarding whether other legal foundations may be identified, which would permit such measures when they affect critical technologies for future development. The study finds that, currently, export controls affecting artificial intelligence and quantum information technology are limited but expanding, thereby creating some urgency in finding legal solutions to counteract their effects. Updating of the EU legal infrastructure, which is not ready to counteract the unintended effects of export controls on the EU, is also found as necessary.

KEYWORDS: export controls, economic coercion, artificial intelligence, quantum information technology, United States, People's Republic of China, European Union.

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1. Introduction

Technological development, as well as societal resilience, are contingent in large part on unhindered, cross-border flow of information (e.g. scientific discoveries) and of other assets or goods (e.g. tangible assets including raw materials, manufacturing technologies, and various manufactured items such as advanced semiconductors and other computer hardware, as well as intangible assets such as specialised knowledge and manufacturing know-how) that integrate the latest advancements. Therefore, free flow of these assets—that is, freedom of trade in the widest possible sense—is significant to global, regional and national techno-economic development. Such free flow also provides exchanges that allow research, development, and marketing of new technologies for significant potential profit in the framework of a self-reinforcing virtuous cycle.[1]

Therefore, any conditions that result in constraints on the freedom of trade must necessarily—and conversely—lead to serious economic consequences on the one hand and hinder technological development as a whole on the other. Erection of trade barriers, including in the form of export controls—regardless of the reason—constitutes such a type of constraint. When such measures are instituted regarding cutting-edge technologies, the stakes become even higher. Yet, this is exactly the situation in which the world economy now finds itself, after several waves of export controls instituted by the United States (US) against the People's Republic of China (PRC) and the counter-restrictions implemented by the same token.[2]

Restrictions of this type, however onerous on the parties directly at odds with each other, should be viewed from not two but rather three different perspectives: that of the "sender," the supplier instituting the export restrictions having considerable leverage due to monopoly on the supply of the controlled assets; the "target" meant to be affected by the restrictions; and third parties suffering the consequences of the extraterritorial effects or the general economic consequences of export controls.

[1] See Grossman and Helpman, 1995; Garnsey, 1998; Goertzel, Goertzel and Goertzel, 2017; Markolf et al., 2018.
[2] See Hrynkiv, 2022; Köstner and Nonn, 2023; 'The United States announces', 2023.

In this study, I first aim to briefly elicit the notion of export controls and enumerate some of their negative effects; then, I introduce the related concepts of economic securitisation and economic coercion, by which trade exchanges and economic advantage become subjected to national security-oriented actions. Second, I delve into the international law implications of export controls as forms of economic coercion when they affect a vital resource. I refer to the example of the 1973–1974 oil embargo that resulted in differing views on the legality of such controls. These views are, in my opinion, now being overlooked, even though artificial intelligence (AI) and quantum information technology (QIT) are predicted to be more transformative to mankind's long-term development compared to oil (petroleum). The present study does not aim to thoroughly analyse the specifics of such dual-use technologies, the transformative nature of which is now taken as fact, focussing instead on the implications of the export regulations applicable to them.[3] Third, I examine the export controls applied to AI and QIT instituted by the US against the PRC starting in 2019, which were later extended several times. I view this set of export controls from the technological and the international law perspective, considering their effects on the European Union and its member states as not only partners to the export controls but also affected third parties. Finally, I endeavour to speculate on some future developments and legislative necessities in the field of export controls aimed at restricting the export of AI- and QIT-related items.

2. Export Controls and Economic Securitisation

Export controls of what are considered sensitive technologies likely date back to time immemorial.[4] However, the 20th century brought a never-before-seen widening in the scope of such measures[5] when it comes to technologies considered vital to the national interest of, especially, major powers. Such controls exist in different forms, which include export prohibitions (export bans or embargos); licensing requirements for the export of certain assets; export quotas, export taxes, or minimum export

[3] For a description of such technologies and the technological rationale for restricting their exports, see Székely, 2024.
[4] For some historical examples, see Voetelink, 2022a, p. 70.
[5] See Aubin and Idiart, 2016. For a comprehensive history of export controls in a wide sample of jurisdictions, including in Hungary, see Tamotsu, 2016.

prices; and even establishment of a state monopoly on the export of assets.[6] In the course of this study, I shall focus mainly on the first two categories of export controls among those listed, as targeted export bans and onerous licensing requirements have been put into place in recent years, affecting technologies necessary for the deployment of AI and QIT.

The justification for instituting export controls may differ, with economic and strategic considerations often intertwined. Some controls may be instituted for pure economic advantage (preventing the adoption of technologies by competitors, enhancing domestic production or protecting strategic industries from competition, protecting intellectual and industrial property from being unlawfully acquired by others, etc.). Others may aim to defend—broadly, wholly, or at the very least partly—non-economic interests, such as maintaining a technological edge over perceived adversaries and preventing[7] proliferation of some categories of weapons or technologies with possible dual uses (military and civilian, nefarious and beneficial, and moral and immoral).[8]

A specific reason for the institution of restrictive measures, regarding not only dual use but also single use of even (apparently) purely civilian technologies, is the increasing "securitisation" of economic interactions between various states. Securitisation denotes an approach by which economic and technological advantages, as well as maintenance of those advantages, are considered paramount to national security; this approach is not new but is experiencing renewed resurgence.[9] While securitisation has historically been considered exceptional as a reason for restricting trade flows and instituting restrictions on exports, among other forms of trade, a new and worrying normalisation of such measures is now occurring.[10] This has made the measures' study all the more essential to predict the future risks posed by the fragmentation of trade in and development of advanced technologies.

Export restrictions evidently affect trade relations and result in the sub-optimal allocation of resources when viewed from the global economic

[6] Bonarriva, Koscielski, and Wilson, 2009, p. 2.
[7] See Lentzos and Silver, 2012; Hrynkiv, 2022.
[8] For the varying notions collected under the term of "dual-use technology," see Sanchez, 1987; Rath, Ischi, and Perkins, 2014.
[9] Casarini, 2013, p. 182; Mawdsley, 2013, pp. 11–12; Mola, 2023.
[10] See Floyd, 2007, 2019.

perspective. Some of their impacts have been summarised in the relevant literature:[11]

1. Export controls lead to lost business for exporters from the jurisdiction that has instituted such controls, as well as from other jurisdictions, even those not involved in tensions that prompted the controls in the first place, if they are applied extraterritorially.
2. Such controls reconfigure economic and trade flows, thereby advantaging actors that can circumvent them at the expense of those that are compliant.
3. They hinder knowledge transfer and therefore technological and wider economic development, especially in a context where such development stems from international cooperation. This occurs even if the information or knowledge concerned is not strictly technology relevant (e.g. export controls instituted on certain items also prevent market research related to these items in countries to which they could not be exported). Export controls, especially in the category of so-called "deemed exports," may even prevent *domestic* knowledge transfer, such as in academic settings, even if the information being disclosed is just export restricted and not classified.
4. Export controls reduce competitiveness by imposing onerous compliance requirements (e.g. internal and external compliance checks) on exporters, not only regarding items, knowledge, and technologies specifically subjected to control measures but also where it is questionable if such controls are even applicable. Transaction costs are also increased due to the discretionary nature of some export controls.
5. Re-exports or maintenance may also be prohibited by export controls. Moreover, even the transfer of non-controlled items is subject to export controls if they use other, controlled items. For example, if an assembly line manufactured in a jurisdiction, and in turn exported, is used to manufacture items in that second jurisdiction, which would then, in turn be exported to a third jurisdiction, it is subject to export controls.
6. Investment in capital-intensive export-related activities may be reduced if risks of export controls persist, as such situations constitute a disincentive to both producers and exporters.

[11] Seyoum, 2017, p. 55.

Along with import restrictions and other measures meant to impede free trade, regardless of the reason for their imposition, export controls may constitute a subcategory of conduct known as economic coercion[12] in international relations. According to this, outside other, preponderantly domestic economic purposes (e.g. raising government revenue, promoting domestic industries, diversification of exports, etc.),[13] a state with control over the supply, markets, or distribution of a given tangible or intangible asset will seek to control the distribution of that asset. The aim is to modify the economic, political, or other conduct, or the posture of another state[14] by, *inter alia*, discouraging it from a given policy, forcing the withdrawal or amendment of a given policy, or forcing compliance with the policy choices of the state initiating economic coercion.[15]

Economic coercion, at a significant cost to the "sender" (actor initiating the export controls) was found[16] to be in correlation with a higher expectation of future conflict with the "target" (e.g. actor suffering the effects of export restrictions). Despite the apparent futility of such measures in some cases, there is ample evidence to show that economic coercion is efficient, specifically in shaping the conduct of the target state, in ways that are seldom made public.[17]

It is worthwhile to note that public discourse currently tends to differentiate between trade restrictions imposed by Western powers, which usually *are not* labelled as coercive but rather defensive (e.g. export controls and restrictions imposed on semiconductor exports to the PRC are usually set in the framework of mitigating national security threats), even if such measures clearly conform to the definition[18] of economic coercion. However, similar measures imposed by non-Western powers, including the PRC (e.g. possible export control[19] measures instituted against Taiwan) *are*

[12] See Chapman, 2013, p. 331; Hackenbroich, Medunic, and Zerka, 2022; OECD, 2024.
[13] Bonarriva, Koscielski, and Wilson, 2009, pp. 2–5.
[14] Olson, 1979; Drezner, 2003, p. 645; Uren, 2020.
[15] Tanner, 2007, p. 13.
[16] See Drezner, 1998.
[17] Drezner, 2003, pp. 652–656.
[18] A functional definition of economic coercion is given by Drezner, in the following form: '… the threat or act by a sender government or governments to disrupt economic exchange with the target state, unless the target acquiesces to an articulated demand ….' Drezner, 2003, p. 643. For an expanded but essentially identical definition, as well as an analysis of various definitions, see Carter, 2009. For the intricacies of properly defining economic coercion, see Tzanakopoulos, 2015, pp. 618–623.
[19] Tanner, 2007, pp. 16–17.

regularly labelled as being coercive.[20] Several measures[21] taken by the PRC in fact differ little from similar measures exercised by other great powers, leaving room for perceived hypocrisy. The effect is the institution of a "siege mentality" in the target country, ultimately subverting the goals of the coercive measures themselves.[22] This apparent double standard is not at all new. The most poignant examples constitute, on the one hand, the vehement Western (specifically US) reaction to the 1973–1974 oil embargo instituted by several OPEC members, initiated by what were deemed as "third-world" countries, and, on the other hand, the widespread use of economic coercion against states in the Global South throughout the Cold War and beyond for the advancement of Western economic or political agendas.[23]

3. Evaluating Economic Coercion Through Export Controls in International Law: The Old Oil and the New

As evident from the above, the relationship of export controls with the written and unwritten rules of international order and international trade is of interest. This is all the truer in determining the possible actions taken by state participants for present and future conflicts with an economic and/or military component, especially since economic coercion, in the form of weaponised economic policies and sanctions, may constitute an act tantamount to economic warfare.

The prohibition of using economic or political coercion is apparently settled—in principle—in both binding and non-binding international instruments, even if international coercion itself is considered an indispensable part of what is deemed "diplomacy."[24] As such coercion is usually an instrument most readily available to great powers or alliance systems, international raw material export cartels that have a monopoly over certain assets and states situated in geographic bottlenecks should also be noted. Some states will inevitably have significantly wider powers of coercion than others.

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[20] See, for example, Piekos, 2023.
[21] See Reynolds and Goodman, 2023. See also Nanopoulos, 2023.
[22] Gueorguiev, McDowell, and Steinberg, 2020.
[23] See Olson, 1979; Zoller, 1984, p. 70; Subrahmanyam, 1993.
[24] Farer, 1985, pp. 405–407; 'The use of nonviolent coercion', 1974, pp. 990–991.

Article 2(4) of the United Nations (UN) Charter[25] provides for general prohibition of 'the threat or use of force'. The cited text suffers from inadequacy in its construction (which may or may not be deliberate) by not defining the notion of "force," thus allowing the co-existence of several competing interpretations regarding whether (1) the framers envisaged the prohibition of economic coercion as falling under the ambit of the rule and, (2) if they did, whether the prohibition is a rule of international *jus cogens* or simply a future or even unattainable desiderate in international relations.[26]

Under this perspective, it remains questionable whether economic coercion in the form of export controls may constitute a prohibited use of force. The Preamble of the Declaration on Principles of International Law Concerning Friendly Relations and Cooperation among States, in accordance with the UN Charter, expands on the interpretation of the use of force:

> No State may use or encourage the use of economic, political or any other type of measures to coerce another State in order to obtain from it the subordination of the exercise of its sovereign rights and to secure from it advantages of any kind. Also, no State shall organise, assist, foment, finance, incite or tolerate subversive, terrorist or armed activities directed towards the violent overthrow of the regime of another State, or interfere in civil strife in another State.[27]

An identical text is included in the Declaration on the Inadmissibility of Intervention in the Domestic Affairs of States and the Protection of Their Independence and Sovereignty.[28]

Both latter instruments are mere declarations and thus are non-binding; yet, their relation to the UN Charter permit them to spell out the principle of the prohibition of use of force as well as its constitutive elements. The juxtaposition of economic coercion with violent forms of

[25] According to the United Nations Charter, 1945, 'All Members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state, or in any other manner inconsistent with the Purposes of the United Nations'.
[26] 'The use of nonviolent coercion', 1974, pp. 986–988.
[27] UN General Assembly, 1970.
[28] UN General Assembly, 1965.

force in the cited texts—in and of itself—shows that the two categories were meant to be evaluated as, at the very least, comparable by the framers of the declarations.[29] The UN declarations on friendly relations and non-intervention were intended to be authoritative sources for the interpretation of the UN Charter and were quasi-unanimously adopted as such.[30]

The case has been made for a narrow interpretation of Article 2(4) of the UN Charter, arising specifically from the declaration on friendly relations.[31] However, these declarations were at the time widely construed—including by the US—as prohibiting economic coercion in the context of the 1973–1974 oil embargo. This interpretation was later embraced in paragraph 4 of UN General Assembly Resolution 3171 (XXVIII) of 17 December 1973 – Permanent Sovereignty Over Natural Resources.[32] Such wider interpretation also appears preferable because not only was it included in some later instruments but framers of Article 2(4) of the UN Charter also clearly did not envisage a restrictive interpretation of "force" (as evident from the lack of any further adjectives, or attributes associated with the notion, such as "armed force" as in Article 46 of the Charter). Furthermore, an expansive interpretation is compatible with the spirit of the charter and the initial intention of the framers to advance world peace and suppress aggression; this latter notion is itself broadened by early UN General Assembly resolutions to an extent that may include economic coercion, which is in a way compatible with the general direction of post-Second World War evolution of international law.[33]

The inadequacy of the generally formulated prohibition of economic coercion was pointed out in the literature, with some authors arguing that such actions, as tools of international relations, are in reality often used and rarely complained about.[34] It was also stated that if economic coercion might be considered a use of force (aggression) under the UN Charter, for such measures to be permissible under international law, they would have to fall within the distinct categories of self-defence, UN-authorised reprisals

[29] As noted in the literature, legal scholars and states in the Global South from the outset advocated such an interpretation, equating economic coercion with threat or use of force, which was only adopted by the US during the 1973–1974 oil embargo. Lillich, 1975, pp. 360–361.
[30] Lillich, 1975, pp. 362–364.
[31] See 'The use of nonviolent coercion', 1974, pp. 994–997.
[32] UN General Assembly, 1973.
[33] 'The use of nonviolent coercion', 1974, pp. 997–1010.
[34] Farer, 1985, p. 406.

against actions incompatible with the UN Charter, or "countermeasures" involving the unilateral suspension of obligations assumed under international agreements (a category I shall briefly discuss below). Therefore, economic coercion in cases that do not fall within one of these categories might even warrant armed retaliation based on the aforementioned principles, especially the right to self-defence.

This last distinct possibility was in fact discussed as a justification in international law to a proposed military response by the US to end the 1973–1974 oil embargo.[35] The embargo, as a moment in history, is all the more significant. This is because it was in the context of this unprecedented measure of coercion that the doctrine of equal access to raw materials was proposed as a new *jus cogens* rule that was later codified into international public law. The embargo was in effect qualified as a form of use of force by economic coercion, contrary to Article 2(4) of the UN Charter, because it deprived industrialised Western powers, all of them oil importers, from a vital resource.[36] This doctrine was included in one form into Article 6[37] the Charter of Economic Rights and Duties of States.[38] While the language of Article 6 "particularly" refers to "commodities" (i.e. raw materials), the intention is clear: The international trade of goods should not be hindered by economic coercion (at last not when industrialised states would suffer a penury of raw materials imported from the Global South as a result). Any state that does so may run afoul of the provisions of Article 2(4) of the UN Charter.

One further problem raised in international public law must be examined when qualifying economic coercion as a possible form of the use

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[35] Farer, 1985, pp. 411–413. In Farer's opinion, economic coercion would only present sufficient gravity as to be considered aggression if it were directed against the territorial integrity or political independence of a state (in my opinion, ignoring the final provisions of Article 2(4) of the UN Charter).

[36] Lillich, 1975, p. 370.

[37] According to the UN General Assembly, 1974.

> It is the duty of States to contribute to the development of international trade of goods, particularly by means of arrangements and by the conclusion of long-term multilateral commodity agreements, where appropriate, and taking into account the interests of producers and consumers. All States share the responsibility to promote the regular flow and access of all commercial goods traded at stable, remunerative and equitable prices, thus contributing to the equitable development of the world economy, taking into account, in particular, the interests of developing countries.

[38] Lillich, 1975, p. 371.

of force: While the UN Charter may be considered a primary and *jus cogens* norm when it comes to obligations set forth for states, and it seems to prohibit economic coercion—or at least it seemed so during the 1973–1974 oil embargo—this is not always the case with secondary international law. We have seen that the general prohibition of economic coercion is not universally accepted, as international relations are said to presuppose a given amount of coercion by their very nature.

A true tension therefore exists[39] between the primary rule of international law (prohibiting use of force) and the secondary rules, which seem to allow for coercion,[40] preventing the institution of the fundamental right of states to be entirely free of such coercion by other states. Coercion, taking the form of self-help, or "countermeasures" (as referred to in Articles 49–51 of the document titled Responsibility of States for Internationally Wrongful Acts[41] [ARSIWA] submitted in the UN General Assembly by the UN International Law Commission), is thought to be inevitable in enforcing compliance with some rules of international conduct.[42] Such countermeasures may be limited in scope and proportionality.

They may be enacted in the context of Article 49 of the ARSIWA, which provides as follows:

> Object and limits of countermeasures
> 1. An injured State may only take countermeasures against a State which is responsible for an internationally wrongful act in order to induce that State to comply with its obligations under part two.
> 2. Countermeasures are limited to the non-performance for the time being of international obligations of the State taking the measures towards the responsible State.
> 3. Countermeasures shall, as far as possible, be taken in such a way as to permit the resumption of performance of the obligations in question.

It is clear from the norm that such countermeasures would not cover all possible forms of economic coercion, mainly allowing for material and

[39] Tzanakopoulos, 2015, p. 617.
[40] Zoller, 1984, pp. 70–73.
[41] UN General Assembly, 2001.
[42] Tzanakopoulos, 2015, pp. 624–627.

temporary non-performance of some international obligations (except those excluded by Article 50 of the ARSIWA). It is questionable if they would even cover all forms of export restrictions (although in my opinion, it is likely that the restriction of commodity exports as referred to above would be permitted as a countermeasure).

In any case, such countermeasures, as well as similar compliance-inducing instruments accepted in international practice because of the breadth of their effects—which may include intervention into the foreign affairs of other states (e.g. as seen during the Greek sovereign debt crisis) that may radically coerce a state to adhere to international agreements or adopt a behaviour favourable to other states—seem to exclude the existence of the fundamental right of states to be entirely free from coercion.[43] However, this does not mean that any wanton measure of coercion, regardless of its nature and magnitude, would be allowed. In fact, unjustified coercion seems as much excluded by the above norms of international law as the right to be free from coercion.

To this legal tension another one is added, due mainly to the political nature of economic coercion when it is utilised. As noted in the context of the 1973–1974 oil embargo, US protestations against what it deemed to be economic coercion stand in stark contrast with the fact that coercive economic measures were quite prevalent in US foreign policy in the same period.[44] Such measures remain prevalent today. Coercion by the US and other Western states was often complained about by others, especially in the region that today would be called the Global South.[45] Economic coercion, as evident, is best practiced by major powers.[46] Therefore, economic coercion seems to be a measure that, when proposed or implemented by some major powers, seems less contested than it is when implemented against the same powers. This elicits what can only be called a double standard, prejudicious to the conceptual unity of international law.

It is interesting to note that Article 52 of the Vienna Convention on the Law of Treaties of 1969 provides for rendering null and void any international convention reached under the ‘threat or use of force in violation of the principles of international law embodied in the Charter of

[43] Tzanakopoulos, 2015, pp. 630–633.
[44] Lillich, 1975, pp. 364–365.
[45] Olson, 1979.
[46] Farrell and Newman, 2019.

the United Nations'.[47] Even if this provision is generally considered[48] to not invalidate treaties reached as a result of economic coercion, the very existence of the text is significant, as it is still apt to undermine any settlement that may flow from such coercion.

It is also worthwhile to note that another sort of tension exists under international law concerning export restrictions and other means of coercion—the principle of freedom of trade (trade in weapons is not included here)—which is recorded in numerous instruments, even if this tension is apparently alleviated by clauses enshrined in such instruments. Examples of the instruments include Article XXI(b)(ii)—and also XXI(b)(iii)—of the General Agreement on Tariffs and Trade in its 1994 iteration and Article 346(1)(b) of the Treaty on the Functioning of the European Union.[49] Both texts, which mirror each other quite closely, refer to trade in arms, other implements of war, or—in the case of Article XXI(b)(iii) of the General Agreement on Tariffs and Trade—war or other international emergencies, while Article XXI(b) mentions 'essential security interests'. Therefore, these instruments do not envisage permitting disruption to (global) free trade between their parties, based on any unspecified threats to national security, such as simply maintaining national economic supremacy. It has even been argued, that 'essential security interests' alone, in the absence of armed conflict, may not justify disruption of free trade at all.[50] Export restrictions not enacted within the rather strict confines of these texts may thus constitute a breach of the listed instruments.[51]

The scope of the application of economic coercion in the possible wider interpretation of Article 2(4) of the UN Charter, as outlined above, is mostly limited to trade in critical raw materials (such as oil). Nevertheless, there is an argument to be made for a possible analogy in cases of economic coercion by restricting trade in assets such as semiconductors or other information technology-related equipment should any such manufactured goods constitute a vital resource for a state's economy. (This argument has been made, in effect, in the runup to the adoption of the EU's Anti Coercion Instrument, which I shall present below.)

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[47] Partridge, 1971, p. 755.
[48] Ibid., pp. 767–768.
[49] Voetelink, 2022a.
[50] 'Article XXI. Security Exceptions', 2012, pp. 600–602; Randazzo, 2014.
[51] Rajput, 2022.

The problems of economic coercion, countermeasures, and resilience against them—just as economic interconnectedness itself—are strongly linked to technological development, as any factor that diminishes the free flow of ideas and technologies in the broadest sense will also slow or possibly deform technological development. If, for example, a ban on the export of advanced semiconductors and their manufacturing equipment by one global power is answered by an export ban on rare earth metals on which the same high technology relies,[52] the effects on technological development as a whole are easy to predict.

Transformative foundational technologies such as AI and QIT will, by all appearances, be vastly more significant for the future of humanity than oil ever was, although the latter literally fuelled the economic and technological development of the 20th century.[53] Their use may last for millennia, possibly even throughout the future of humankind, whatever that future might be. The significance of export restrictions in an industrial society reliant on "old oil," in its literal sense, may be outweighed may times over in the case of societies basing themselves on the "new oil" of transformative foundational technologies. Competition in developing, deploying, and obtaining such technologies in and of itself is conducive to economic coercion through the institution of export controls, which may then lead to "countermeasures" by similar means.[54] Importantly, an increasing tit-for-tat of measures such as export bans and export controls seems to not diminish to a possibility of conflict once they are adopted,[55] a finding that associates grave risks with such measures, which, instead of serving a de-escalation, may even contribute to a further rise in economic and political tensions.

This warrants a future study not only of economic coercion by the restriction of access to such technologies under the present and future rules of international law but also of the structure of such restrictions, something I now set out to do for the remainder of this study.

[52] See Seyoum, 2017; Wilson, 2018; Yang, Wang, and Whang, 2024.
[53] See Jiang et al., 2022; Jones, 2023; Liu et al., 2018; Majot and Yampolskiy, 2015; Makridakis, 2017; Popkova and Gulzat, 2020; Perrier, 2022; West and Allen, 2018.
[54] Dalton et al., 2019.
[55] Drezner, 1998; Pape, 1997.

4. Export Controls in the Field AI and QIT

4.1. Raison d'être of Export Controls in the US–PRC Relationship and its Implications in International Law

That AI is a transformative technology, as we have seen, stands beyond any doubt. Its significance for economic and social development is predicted to be near-unparalleled and is, therefore, of strategic importance to all those possessing and desiring to harness this technology. The same may be said, perhaps in narrower terms, of QIT, as it may reshape telecommunications, cryptography, and cryptanalysis in ways that will be nothing short of fundamental.[56] It is therefore no surprise that AI, especially, has become the latest battleground between major powers, specifically the US and the PRC, as dominance of the field has become equated with global military and economic supremacy.

Technological development in the PRC has given birth to misgivings in the US for a long time, even after Cold War technology transfer rules were relaxed, with two competing lobbies developing in US law-making: Those advocating the so-called "run faster" model of development proposed technological cooperation and trade with the PRC as the guarantee of continued US technological supremacy, while the "control hawks" lobbied for restricting significant dual-use technologies from being exported to or accessed by companies in the PRC.[57] Eventually, beginning in 2019, on the backdrop of significant advances by Chinese companies such as Huawei, this second lobby prevailed, resulting in the institution of first targeted and then more general export controls by the US against the PRC. In the words of a US Congressional Research Service report, this came about,

> … to address concerns about China's attempts to seek global civilian and military leadership in advanced and emerging technologies through coordinated industrial policies. Tightened controls respond to China's ambitious state-led industrial efforts, such as its Made in China 2025 (MIC 2025), that intend to create competitive advantages for China in strategic industries, in part by obtaining technology and expertise from U.S. and foreign firms. MIC 2025 aims to make China a leader

[56] Shagina, 2023.
[57] Meijer, 2016.

> in emerging technologies important to future commercial, government, and military systems and capabilities.[58]

It is quite unequivocal that the aim of current US export controls directed against the PRC in the field of emerging technologies is to prevent the latter power from effectively competing with the US or obtaining technological advantage over the US, including in purely civilian domains.[59] It may also be posited that, from the perspective of international law, export controls instituted in the US–PRC relationship (i.e. by both actors) are clearly coercive in nature. They are part of a geo-economic rivalry in which the US aims to prevent the PRC from attaining economic supremacy, and the PRC aims to resist such an attempt. The US strategy, which is the more significant one from the perspective of this study, calls for,[60] *inter alia*, insulating the PRC from access to advanced technologies.

Following historical precedent set by previous (First) Cold War technology controls,[61] in the implementation of this strategy, the US legislative opted for an export control regime affecting so-called 'emerging and foundational technologies' that are 'essential to the national security of the Unites States'[62] (also called 'critical technologies'), through the Export Control reform Act of 2018 (ECRA),[63] in force as of 2019. Among the technologies slated for newly instituted export controls 'AI and machine learning' and 'quantum information and sensing technology' are prominently listed,[64] even if these are still hypothetical or of limited practical applications.[65] The authority for including various items thought to be linked to these technologies in the export restrictions lists currently lies with the president of the US, who may exercise it after consultations within the administration, making US export restrictions subject to administrative measures for added flexibility, based on a national security rationale.[66]

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[58] Congressional Research Service, 2021, p. 27.
[59] See Schmidt et al., 2021, pp. 223–240.
[60] Luttwak, 2012, pp. 266–269.
[61] Jones, 2020a, pp. 33–36, 45.
[62] ECRA, Section 1758.
[63] United States: Export Control Reform Act (ECRA), 2019.
[64] Jones, 2020a, p. 47.
[65] Ibid., p. 44.
[66] Ibid., pp. 55–57. When determining which technologies should be placed on export control lists, pursuant to Section 1758 of the ECRA, the contents of the Wassenaar

Restrictions of trade in these technologies are aimed at kerbing Chinese geopolitical great-power ambitions, including by preventing the PRC from attaining the goals stated in its Made in China 2025 programme, while also sealing the PRC off from access to foundational transformative technologies that may be crucial for its further economic development, beyond the 2025 horizon. The question arises as to what the international public law implications of such a coordinated set of measures should be, justified by securitisation of economic and technological advantage and aimed at hindering the economic development of a competing economy. Traditionally, export controls—notwithstanding those instituted during or related to the use of armed conflict—have been and remain based in international/sanctions law or human rights law, respectively,[67] which provide the two sets of principles that may justify such measures. Along with these legal bases, the right of individual self-defence of states[68] could also be considered. However, despite the lack of any form of aggression to defend against but considering the conditions of necessity, imminence, and proportionality,[69] this right may be ignored in the present case. This is because the stated aim of US measures is not to answer any use or threat of force directed against the US by the PRC but to ensure economic and military containment of the PRC to prevent it from reaching a state of technological and geo-political supremacy. As this objective clearly lies outside the bounds[70] of self-defence in international law, I shall not examine this possibility separately.

As we have seen, when discussing the international legality of economic coercion against the PRC, sanctions law as a fundament for such actions is problematic, as it would in theory require acquiescence by the UN, so as not to constitute potentially prohibited economic coercion, an

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Arrangement's proscription lists are regularly considered and updated. Bureau of Industry and Security, 2022; The Wassenaar Arrangement Secretariat, 2023.

[67] Voetelink, 2022a, pp. 84–90.

[68] See Alexandrov, 1996, pp. 121–149.

[69] Akande and Liefländer, 2013.

[70] Anticipatory self-defence, or defence from the threat of the use of force might come to mind, despite the distinct lack of imminent aggression directed against the party defending itself by economic coercion. See Alexandrov, 1996, p. 149; Azubuike, 2011; Weightman, 1951. Some authors mention the national security decisions reached without the use of force or that were at least threatened as being possibly compatible with the objective of international self-defence. See Schachter, 1989. However, these ad-hoc measures are not compatible with the current state of international (UN) law.

authorisation that is clearly absent. Still, it is sanctions law that forms—at least at the declarative level—the foundation of current US-imposed export restrictions targeted at the PRC, with the various measures taken being based on supposed technology theft being committed against US interests, the decreasing lead of the US economy over that of the PRC, and increasing foreign trade deficits.[71] Human rights law is sometimes also cited as a basis for some measures (especially directed against mass surveillance conducted by the PRC and the repression practiced against the Uyghur community).[72]

When it comes to justifying export controls, one more problem must be addressed in international law, namely whether they are compatible with the General Agreement on Tariffs and Trade (GATT) signatory and World Trade Organisation (WTO) member status of both the initiating and target jurisdictions. This is done based primarily on the supposed national security exemption apparently allowed for in the GATT.[73] Such a position, as we have seen, is vulnerable as, under the GATT, national security seems not to constitute an autonomous exemption for instituting trade restrictions outside some manner of conflict. It is perhaps also worth to spare a moment and consider the justification of export restrictions instituted by the PRC against the US (as well as other states), adopted quasi-simultaneously with US measures. In this latter case, the measures might be considered retaliatory, bringing them closer to the categories of self-defence and "countermeasure" rationales.[74] This creates the appearance that, at least considering the ARSIWA rules outlined above, the Chinese export controls may find justification on the doctrine of legitimate countermeasures, while the US measures are outside any treaty-based regime and are, in fact, unilateral restrictions of trade not authorised by either the UN or WTO.

4.2. Meagre Substance of Export Controls in the Field of AI and QIT

The Bureau of Industry and Security (BIS) is the US federal agency overseeing the export control regime established under ECRA. This entity manages the export control lists for various transformative (foundational) technologies, which are identified by the president of the US after administrative consultations as being subject to such restrictions (the so-called Section 1758 list, as a reference to the ECRA provision permitting the

[71] Hufbauer and Jung, 2020.
[72] Congressional Research Service, 2021, p. 29.
[73] 'The United States announces', 2023.
[74] Rajput, 2022.

designation for control of such technologies).[75] These provisions use several approaches to instituting export controls, depending on the technology subject to control (classification-based controls) and the entity it is destined for (end-user based controls).[76]

The following are technologies targeted for (mostly future) export controls in the field of AI:

(i) Neural networks and deep learning (e.g., brain modelling, time series prediction, classification);
(ii) Evolution and genetic computation (e.g., genetic algorithms, genetic programming);
(iii) Reinforcement learning;
(iv) Computer vision (e.g., object recognition, image understanding);
(v) Expert systems (e.g., decision support systems, teaching systems);
(vi) Speech and audio processing (e.g., speech recognition and production);
(vii) Natural language processing (e.g., machine translation);
(viii) Planning (e.g., scheduling, game playing);
(ix) Audio and video manipulation technologies (e.g., voice cloning, deepfakes);
(x) AI cloud technologies; or
(xi) AI chipsets.[77]

For QIT, the BIS envisages necessary restrictions regarding the following technologies: '(i) Quantum computing; (ii) Quantum encryption; or (iii) Quantum sensing'.[78]

The list of such technologies is largely in line with those considered as "critical and emerging technologies" by the US administration, which enumerates the following technologies:

Artificial Intelligence (AI)

- Machine learning

[75] Tongele, 2022a, 2022b.
[76] Whenever applying export controls, several methods of regulation are possible. Such controls may be instituted depending on whom they target ("end-user" controls), what purpose of use they prohibit ("end-use" controls), what items they refer to ("classification" controls), or where the controlled item is headed ("destination" controls). Voetelink, 2022a, p. 72.
[77] Bureau of Industry and Security, Commerce, 2018.
[78] Ibid.

- Deep learning
- Reinforcement learning
- Sensory perception and recognition
- AI assurance and assessment techniques
- Foundation models
- Generative AI systems, multimodal and large language models
- Synthetic data approaches for training, tuning, and testing
- Planning, reasoning, and decision making
- Technologies for improving AI safety, trust, security, and responsible use Quantum Information and Enabling Technologies
- Quantum computing
- Materials, isotopes, and fabrication techniques for quantum devices
- Quantum sensing
- Quantum communications and networking
- Supporting systems.[79]

As can be seen from the list of technologies proposed as subject to future export restrictions in 2018, the intended reach of the measures was exceedingly wide. The enumeration includes many, if not the most, current and predicted applications of the given technologies in imprecise general, non-technological terms. It apparently envisages a mostly end-user-based or a very wide classification-based regime, where entire technologies, especially those destined to be used by certain entities linked to the PRC, would have been entered into the BIS proscription lists.

However, the reach of the regulators seems to have largely exceeded their grasp. In effect, until now, all[80] measures aimed at limiting technological exports regarding AI have been quite targeted ones, with the BIS entity list—the list of end-users prohibited from obtaining technologies—being updated several times, and only semiconductor and semiconductor-manufacturing equipment export restrictions being imposed. In fact, the expansion of blanket measures against PRC-bound AI-related technology exports, adopted on 7 October 2022 and in effect from 16

[79] National Science and Technology Council, 2024, pp. 4, 6. See also 'National Strategy for Critical and Emerging Technologies', 2020.

[80] For the full list of BIS export controls on AI and QIT, see Bureau of Industry and Security, 2024b.

November 2023,[81] which forms the material quasi-entirety of such measures only affects four distinct fields:[82]

1. high-performance (more precisely high processing power) microchips, including ones which do not exceed the thresholds set, but contain technical solutions intentionally 'dumbed down' in order to comply with export controls, but which contain cutting-edge technology (so-called grey-zone chips);[83]
2. expanding licensing agreement requirements for exports to several countries not directly targeted, based on the risk of transfer of prohibited technologies to the PRC (a destination-based restriction);[84]
3. the restriction for the exports of semiconductor manufacturing equipment, and related goods and services (including maintenance) to the PRC, Macau, and the countries for which such restrictions have been expanded as per point 2 above;[85]
4. an expansion of the entity-list (blacklist) of potential end-users.[86]

The dual-use technology proscription lists drafted under the Wassenaar Arrangement, which mirror the US BIS restrictions on technology exports, show that most AI technologies that are currently restricted under this latter regime also comprise computer hardware such as integrated circuits used for the construction of neural networks, neural-network-based computers, high-performance semiconductors (computer chips), and production equipment for such semiconductors, as well as software for operating such systems (as software is usually not treaded as a separate item).[87] The Wassenaar Arrangement comprises all EU member states, apart from Cyprus, and is also the basis for the rules of the EU Dual-

[81] Bureau of Industry and Security, 2023a.
[82] Benson, 2023.
[83] Bureau of Industry and Security, 2023d.
[84] Bureau of Industry and Security, 2024c.
[85] Bureau of Industry and Security, 2023b.
[86] Bureau of Industry and Security, 2023c. For the current full entity-list, see *Supplement No. 4 to Part 744, Title 15. Entity List*, 2024.
[87] Brockmann, 2022, pp. 196–197. The List of Dual-Use Goods and Technologies and Munitions List compiled under the Wassenaar Arrangement does not reference AI at all. The Wassenaar Arrangement Secretariat, 2023

Use Regulation,[88] so that the approach to export restrictions pioneered by the US has been effectively implemented by these states as well.

The review process of AI technologies to be appended to the restriction lists has not elicited any new emerging AI technologies that should be added, with the technological chokepoints of microprocessors, processor assemblies, and related manufacturing equipment mainly being targeted, even by the most recent measures, according to specialist recommendations.[89] As AI software and semiconductors are a sub-optimal target for export restrictions, mostly the manufacturing equipment for such advanced semiconductors is likely to constitute the future target of export controls.[90] Future proposed controls would extend current restrictions—which, as we have seen, now mainly target semiconductors—to entire AI systems as well as scientific collaborations on AI.[91]

In the field of QIT, a similar approach to end-use and classification-based controls as in the case of AI has been adopted: Both the BIS export restrictions and the Wassenaar Arrangement proscriptions lists[92] contain controls for equipment that may be used in quantum cryptography,[93] as well as algorithms that permit encryption that is immune to quantum-technology based attacks (post-quantum encryption), without specifying further or specifying wider technologies as being restricted. Interestingly, and as a quite recent development, end-user controls have been strengthened, with numerous PRC entities involved in quantum technology development being blacklisted.[94] There are voices calling for blanket restrictions on quantum sensing technology (and perhaps even wider restrictions on possible future applications). However based on the most recent developments—and due to

[88] *Regulation (EU) 2021/821 of the European Parliament and of the Council of 20 May 2021 setting up a Union regime for the control of exports, brokering, technical assistance, transit and transfer of dual-use items*, 2021. See also Vandenberghe, 2021.
[89] Eitel, 2023.
[90] See Flynn, 2020.
[91] *Bipartisan Coalition Introduces Monumental Bill Giving Admin Authority to Export Control Advanced AI Systems*, 2024; *Enhancing National Frameworks for Overseas Restriction of Critical Exports Bill*, 2024.
[92] The Wassenaar Arrangement Secretariat, 2023; e.g. category 5.A.2.c,
[93] This is defined as 'A family of techniques for the establishment of a shared key for "cryptography" by measuring the quantum-mechanical properties of a physical system (including those physical properties explicitly governed by quantum optics, quantum field theory, or quantum electrodynamics).' The Wassenaar Arrangement Secretariat, 2023, p. 231.
[94] Bureau of Industry and Security, 2024a.

the remote nature of practical implementations and the as-of-yet unknown and largely unpredictable characteristics of other quantum technologies—restricting these is considered futile for the time being.[95] Component-level restrictions are, for the time being, the norm in the field of QIT.[96]

Both the approaches to AI and QIT show that the US is currently implementing the 'small yard with a high fence' policy.[97] This approach would subject key technologies and especially components to export controls while leaving most other technologies untouched. Very recent developments now cast doubt on how small the yard really is, as the substance of especially AI-related export restrictions has ballooned, and further enhancements are in the works.[98]

4.3. US Export Controls and the EU

US export control law, including ECRA (and the Export Control Act, which it reformed) is constructed in a way so as to regularly apply to entities (i.e. legal and natural persons or groups of such persons) found outside the territorial jurisdiction of the US. This is the characteristic of extraterritorial application.[99] Extraterritorial application draws third parties into the US export control regime as stakeholders and may be prejudicious to the interests of such stakeholders. This is especially true for rules applying to "foreign-made" or "foreign-produced" assets, which gained great significance since the field of technology export controls was vastly expanded after the adoption of ECRA; such restrictions are attached to each US-made part (component) of assets or assets manufactured by the use of US-made equipment (so-called "foreign direct product" restrictions).[100] Extraterritorial application of export restriction may clearly impact EU businesses. The EU has, for this reason, historically opposed extraterritorial application of, *inter alia*, export restrictions and sanctions, based on considerations of international law, even if this stance has softened over time.[101] An example of such opposition is the so-called Blocking Statute, to which I shall return to below. Such extraterritorial effects (and more

[95] Perrier, 2022; Parker, 2024.
[96] Parker, 2023, p. 16.
[97] *Remarks by National Security Advisor Jake Sullivan on Renewing American Economic Leadership at the Brookings Institution*, 2023.
[98] Cavanagh, 2023; He, 2024.
[99] Voetelink, 2022b.
[100] Voetelink, 2023.
[101] Bismuth, 2023.

specifically those of post-ECRA measures by the US) have recently been raised again as a cause for concern by the EU,[102] but they have not yet been effectively acted upon, even if some tools are already available to the EU for counteracting them.

The question arises regarding whether incidental extraterritorial effects of export controls instituted by the US against the PRC, which in turn are prejudicious to EU trade, may be evaluated as forms of economic coercion, which would be contrary to international law and, if its effects are sufficiently grave, may be converted. This is especially important since there is economic competition[103] between the US and EU in the field of high technology; therefore, benign intentions in imposing extraterritorial export controls by the US with effects on EU exports should not be considered a forgone conclusion, even if they are presumed. An even more important question is whether the EU can resist economic coercion from actors such as the PRC. The two questions are in fact intertwined when applicable norms are concerned.

In the instrument titled The European Economic Security Strategy, adopted in 2023, the European Commission stated that the EU Economic Security Strategy's priority is to protect the bloc

> … from commonly identified economic security risks, by better deploying the tools we already have in place, such as on trade defence, foreign subsidies, 5G/6G security, Foreign Direct Investment screening and export controls, as well as the new instrument to counter economic coercion.[104]

The document also identifies 'weaponisation of economic dependencies or economic coercion' as risks identified by the European Commission and High Representative (albeit mostly regarding non-allied economies).

Resisting economic coercion or resilience in the face of such coercion is then clearly significant in enhancing technological sovereignty and strategic autonomy. In the case of the EU, this necessity has not just been recognised but also acted upon by the creation of the European Anti-

[102] European Commission, 2024.
[103] OECD, 2023, pp. 66–68.
[104] European Commission, 2023.

Coercion Instrument (ACI),[105] which entered into force on 27 December 2023. The ACI at Recital (5) explicitly references the prohibition of economic coercion, as contained in the UN Charter and the Declaration on Principles of International Law Concerning Friendly Relations and Co-operation among States as well as the ARSIWA, stating that '[t]hose rules are binding in the relations between third countries, on the one part, and the Union and its Member States, on the other'. Recital (15) is even clearer on the illegal nature of coercion, while at the same time, it allows for setting particular intensity thresholds for action to be deemed as coercive.[106] Therefore, from the perspective of the EU, economic coercion is considered prohibited, at least beyond certain thresholds.

The ACI at Recital (6) states that '[t]he modern interconnected world economy increases the risk of economic coercion, as it provides countries with enhanced means for such coercion, including hybrid mean'. Thus, the EU not only recognises some form of prohibition of economic coercion but also apparently posits its equivalence with the use of force. It refers to "hybrid means" and almost overtly cites the second sentence of the text in

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[105] *Regulation (EU) 2023/2675 of the European Parliament and of the Council of 22 November 2023 on the protection of the Union and its Member States from economic coercion by third countries*, 2023.

[106] Recital (15) reads as follows:

> Coercion is prohibited and therefore a wrongful act under international law when a country deploys measures such as trade or investment restrictions in order to obtain from another country an action or inaction which that country is not obliged to perform under international law and which falls within its sovereignty, and when the coercion reaches a certain qualitative or quantitative threshold, depending both on the objectives pursued and the means used. The Commission and the Council should take into account qualitative and quantitative criteria that help in determining whether the third country interferes in the legitimate sovereign choices of the Union or a Member State and whether its action constitutes economic coercion which requires a Union response. Among those criteria, there should be elements that characterise, both qualitatively and quantitatively, notably the form, the effects and the aim of the measures which the third country is deploying. Applying those criteria would ensure that only economic coercion with a sufficiently serious impact or, where the economic coercion consists in a threat, that only a credible threat, falls under this Regulation. In addition, the Commission and the Council should examine closely whether the third country pursues a legitimate cause, because its objective is to uphold a concern that is internationally recognised, such as, among other things, the maintenance of international peace and security, the protection of human rights, the protection of the environment, or the fight against climate change.

See also Article 4 of the ACI.

the Preamble of the Declaration on Principles of International Law Concerning Friendly Relations and Cooperation among States, which prohibits the use of force in the form of interference in the affairs of another state. Finally, Recital (8) of the ACI firmly asserts that the ACI is a defensive instrument, meant to deter and counteract economic coercion.

While the ACI makes no mention of economic coercion by restricting access to certain vital technologies *per se*, the European Economic Security Strategy refers to this problem by name rather often and in quite broad terms, stating that regarding 'key technologies', '[p]rofound technological shifts are adding to the intensity of this competition and making the economic and security challenges more complex'. Most clearly the strategy states the

> … need to rely on trade and on the Single Market to spur competition and ensure that we have access to the raw materials, technologies, and other inputs which are crucial for boosting our competitiveness, resilience and for sustaining current and future employment and growth.

It should be mentioned that, conversely, to ensure access, the document is also concerned with "technology leakage risks" in the fields of AI and QIT. These desiderates make for a complicated balancing act as the EU aims to prevent withholding of crucial technologies from it, while at the same time promoting their withholding from its competitors. This latter action itself a possible form of economic coercion, where access to vital technologies is restricted in return for political or economic concessions.

Therefore, while the ACI should be viewed primarily from the perspective of a desire to ensure the security of supply in the EU,[107] we should not ignore that some "response measures" taken under Article 8 and Annex I the ACI, such as export and trade restrictions undertaken by the EU, may in and of themselves be perceived as economic coercion be the "target" countries.

While the language of the ACI sometimes references the notion of "countermeasures" relevant under the ARSIWA, in both Article 8 and Annex I, it introduces the competing notion of "response measures." This leaves the door open to applying measures other than those that are legal under the ARSIWA (this is quite apparent from the structuring of items 1–4

[107] See Theodosopoulos, 2020.

in Annex I to the ACI, where the classical meaning of "countermeasures" under the ARSIWA is only truly present in item 4). It seems that while the EU is clearly concerned about being cut off from vital technologies and other resources, it has few qualms about imposing export restrictions of its own, provided there is a sufficient, duly ascertained reason to do so and proportionality is respected. This EU approach is open to criticism, as it is somewhat reminiscent of the US position adopted during the 1973–1974 oil embargo and seems hypocritical. The ACI permits the bloc to be 'running with the hare and hunting with the hounds'[108] at the same time.[109]

Another problem posed by economic coercion, which may affect European interests, involves the collateral effects of coercion by other Western powers, specifically the US, directed at the latter power's geopolitical opponents,[110] especially in the case of the PRC, when such measures are instituted with extraterritorial effects. The ACI is silent on the issue, which falls within the scope of the EU Blocking Statute.[111] However the Annex of the Blocking Statute has not been updated, with the last version of the norm dating to 2018, thus predating the most prejudicious extraterritorial sanctions implemented by the US against the PRC, with effects on the EU.

5. Conclusions

In this study, I examined export controls from the perspectives of international law and foundational, transformative technologies such as AI and QIT. I found that these technologies, much like some important commodities during the 20th century, are likely to form the basis for continued economic development and may therefore be considered vital.

Withholding access to such technologies by way of export controls may, for this very reason, be considered a form of economic coercion. The same can be said of forcing export controls, through extraterritorial application, on third parties to the conflict that prompted them. Both international law and international custom seem unclear on whether

[108] Olsen and Schmucker, 2024.
[109] For some examples, see Packroff, 2023.
[110] Hackenbroich et al., 2020, p. 4; Hackenbroich, Medunic, and Zerka, 2022, p. 9.
[111] *Council Regulation (EC) No 2271/96 of 22 November 1996 protecting against the effects of the extra-territorial application of legislation adopted by a third country, and actions based thereon or resulting therefrom*, 1996; Szép, 2024.

economic coercion is entirely, or at least partly, prohibited and, if yes, how thresholds for such a prohibition may be determined. The international law foundations for export controls unilaterally instituted in the past few years by the US against the PRC are somewhat unclear, even if such controls were then transferred into multilateral non-binding instruments such as the Wassenaar Arrangement, with effects on the EU. This is because neither the UN instruments nor the GATT/WTO infrastructure offer clear grounds for instituting such controls based on a pure national security rationale, particularly in the absence of an armed conflict.

It is perhaps evident from the above that export controls instituted regarding AI and QIT are not going to diminish anytime soon. If anything, the "small yard, high fence" approach seems, to be undermined by proposals for wider restrictions affecting entire technologies (an option seemingly supported by the US BIS list of foundational technologies) and not component-based restrictions, which may be the most likely of near-term outcomes, especially if the PRC manages to sidestep restrictions by enhancing domestic manufacturing capabilities.

In this context, the EU—more a bystander than an actor—is only now re-evaluating measures that should be taken to defend its strategic interests from (both) its competitors. I believe that it is necessary for the EU legislative to address the concerns posed by foreign export controls that, when applied extraterritorially, may have unintended negative effects on European strategic autonomy and technological sovereignty, by updating the Blocking Statute to discourage export controls by competing powers in the way envisaged but not yet acted on by the European Commission. A proposed amendment of this instrument,[112] perhaps by way of a regulation, has already been formulated but was apparently shelved during the incipient phase of its development. Some proposed measures it included read as follows:

> [To] deter and counteract extra-territorial sanctions … the proposed regulation could provide the Commission with powers to apply deterrent and counteracting measures against third countries unlawfully applying extra-territorial sanctions, or persons benefiting from their imposition; this could take the form of commercial or other measures in the field of judicial cooperation in civil matters, as well as exclusion/restrictions

[112] European Commission, 2021.

> from access to the EU capital markets, EU public tenders, or even visa limitations for individuals. The Commission would exercise those powers through implementing acts. Further, the proposed regulation could envisage the award of financial or other types of support to EU operators willing to engage in trade that is prohibited by such extra-territorial sanctions of third countries but not prohibited by Union law.
>
> [To] streamline the application of the Blocking Statute as well as reduce the administrative burden … the proposed regulation could simplify compliance, as appropriate, through: streamlined processing for authorisation requests pursuant to Article 5, second paragraph, of the Blocking Statute, including a review of the information required to process the authorisation request; clarifications of the prohibition to comply with unlawful extra-territorial sanctions of third countries (Article 5, first paragraph of the Regulation), including a possible specific focus on strategic sectors.[113]

Such a proposal is more relevant than ever and should be acted upon in European interest.

The establishment of a fair, rules- (not just interests-) based global export regime could also be achieved by engaging in international cooperation to ensure the creation of a clear, unified, and legally sound basis for their imposition against the PRC to ensure global security. The Wassenaar Arrangement (while non-binding, but largely adhered to) may provide a template for such a multilateral regime entered into by Western powers, with the added value of allaying concerns raised by unilateral export restrictions based on economic self-interest and not collective security. Such a multilateral practice, while possibly viewed as a form of economic containment, would ensure that restrictions remain actionable and reasonable, without recourse to unilateralism on behalf of either the US or EU. This basis should include a clarification of the notion of economic coercion, as a set of thresholds, to avoid any appearance of a double standard.

[113] Ibid.

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