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Technology transfers: the case for an EU-Japan-US cooperation framework



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Technology transfers: the case for an EU-Japan-US cooperation framework

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*There is no desire more natural
than the desire for knowledge*

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INTRODUCTION

How far should the EU go in restricting technology transfers to China? From investment screening and export control to adjusting the rules for international scientific cooperation, the EU and its Member States are significantly improving their defensive toolbox to better monitor transactions and address risks. All those autonomous instruments are “country-agnostic” and apply to the full spectrum of the EU’s international engagement. But taken together, **China’s practice of state capitalism, the scale of the industrial policies supporting the 2016 Innovation-Driven Development Strategy, the ongoing Military-Civil Fusion and Xi Jinping’s ambitions for China to reach global leadership status have been the driving force behind EU’s ramping up efforts on straightening its defense capacity.** And even if the record shows that China is not the primary target of Europe’s screening activity – since the inception of the new system, the EU has been screening more FDI from the US and Switzerland than from China –, the EU’s autonomous instruments have by definition an impact on EU-China relations and thus deserve to be analyzed in that context.

Despite remarkable accomplishments, Europe’s current system contains exploitable loopholes. At first sight, how to address these loopholes is a technocratic question of state capacity and bureaucratic efficiency. Even the best-designed systems need constant improvement. But tech transfer controls should be apprehended from a higher strategic standpoint. **Regulations matter enormously, but so do implementation in practice and the possibility of improving existing mechanisms.** These reflect the degree of political will at the national level, as well as a strategic decision regarding where to position Europe in an international security environment defined by the US-China contest for global supremacy.

The US and Japan are the two leading countries driving the transformation of the global landscape of regulating technology transfers. As the EU completes and improves its toolbox, it will find in the United States and Japan its key external partners for refining the design and the implementation of its controls. Europe should see information exchange with the US and Japan as a useful resource to address practical questions raised by the difficulty of defining emerging technology to avoid transfers that feed China’s Military-Civil Fusion, but also to implement existing controls.

Traditionally, controls have had a relatively narrow focus on transfers to military end-users. In recent years, in the US and in Europe, legislation and regulatory action have expanded to also target human rights violators, both entities and individuals. This trend will continue and is likely to affect EU-China relations but not to a large extent, as China’s domestic technology capacity is able to serve its own surveillance needs.

More fundamentally, Europe needs to face the reality of the US and Japan increasingly using controls as a tool in a global competition for technological supremacy. The recent creation of a ministerial position for Economic Security by Japan's Kishida government is a symbol of that trend. Japan's economic security legislation, currently in the making, will include a variety of measures, from concealing patents in sensitive technologies to favoring production domestically and in like-minded countries to ensure the resilience of industrial supply chains. In the US, the control policy on semiconductor technology has aimed for decades – quite successfully – at keeping the Chinese integrated circuit (IC) industry at least two to three generations behind the state of the art. **If the largest economic powerhouses use controls in combination with industrial policies and subsidies to compete with China, does Europe need to adjust?** The Commission's "open strategic autonomy", which emphasizes the EU's desire for openness and its strategic interest in multilateral norms of behavior, carries the opposite message. How to address that contradiction is a key question for Europe's competitiveness.

After the adoption of the Export Control Reform Act (ECRA) and the Foreign Investment Risk Review Modernization Act of 2018 (FIRRMA), the US is well engaged in a process of reshuffling its technology transfers controls. The Biden administration is seeking to strike a new balance between China as a trade partner and China as a technology competitor. Hence, its cooperation agenda with the EU on China policy mostly focuses on trade and technology issues. It has accepted the EU's proposition to establish the EU-US Trade and Technology Council (TTC), whose inaugural leadership meeting in Pittsburgh last October led to the adoption of an ambitious roadmap and the creation of sectoral working groups. Cooperation with the US is in the interest of the EU to enhance the efficiency of its autonomous instruments. **The main question for the EU is where to place limits on transatlantic cooperation**, given in particular the uncertainties surrounding the future of US-China managed trade, the exceptions that the US often creates to its own rules to serve the interests of American companies at the expense of its competitors among its own allies and friends, and the use of extraterritorial legislation against Europe. The transatlantic partnership is an important horizon for the EU to conduct its own trade and technology policy towards China, but **the risk of seeing the Biden administration further sacrificing European interests to other priorities should not disappear behind the promises of the TTC.**

Over the years, Japan has proven to be an important reference point for Europe when considering ideas, formats and best practices. It exerts strict controls on intangible technology transfers through education and research cooperation. It floats innovative ideas regarding improving the efficiency of export controls. For the EU

and its Member States, Japan should be a mirror that raises at least two important questions: how to address education and research cooperation, and how to make progress when multilateral diplomacy is too slow. For Europe, increased engagement with Japan will be an important complement to the transatlantic partnership. And for emerging technologies affecting the military balance, trilateral EU-Japan-US formats will be relevant.

The policy paper argues that Europe should regulate intangible transfers more effectively to better address China's Military-Civil Fusion and respond to China's industrial policies under its Innovation-Driven Development Model. **Europe should take a broader view of the strategic implications of technology transfers to China and deepen cooperation with the United States and Japan when cooperation can make European policy tools more efficient.** Finally, stricter controls will be largely insufficient to promote European interests in the global competition for technological superiority, whose outcome will define the future international order. Industrial policy is an essential tool, and a European strategy in the age of US-China technology competition should combine control instruments with industrial policy tools (see *Semiconductors in Europe: the return of industrial policy*, Institut Montaigne, March 2022).

EUROPE'S INCOMPLETE TOOLBOX OF DEFENSIVE MEASURES

In the past three years, the regulation establishing a framework for the screening of foreign direct investments into the Union (Regulation 2019/452) and the regulation for the control of exports, brokering, technical assistance, transit and transfer of dual-use items (Regulation 2021/821) have both entered into force. The two texts have already improved the European landscape of controls. **Intangible transfers through foreign direct investment and exports of technology that risk fueling abuses of law enforcement activities are now on the EU's radar screen and increasingly within the scope of regulatory action by all EU Member States.** Overall, the European system has also become more agile and flexible, especially when it comes to the processes of updating control lists and sharing information.

But two questions remain. First, enforcement across the EU will require increased capacity in many Member States, in particular to conduct due diligence and oversee the implementation of decisions. Enforcement also raises the question of increasing the powers of the Commission for the sake of efficiency. Secondly, like other advanced economies, the EU struggles to better cover emerging technologies as a matter of FDI screening, and in its export control regimes. This requires international cooperation and coordination.

1. Investment screening

1.1. The current status

The EU's investment screening regulation has been operational since October 2020¹. The mechanism it has created, centered on the Commission as a hub but working across Member States, is a powerful tool to monitor foreign direct investment and block transactions that risk undermining European security interests. **A new unit for "Technology & Security, FDI screening" has been established within DG TRADE to oversee problematic transactions, operate the newly-established communication mechanism with Member States, and coordinate the response of the Commission when it issues an opinion.**

The system created by the regulation has three main features:

- The communication mechanism between the Commission and Member States constitutes the backbone of the system. Member States are legally obliged to notify transactions being screened, giving the Commission and other Member States unprecedented visibility over FDI inflows and an opportunity to request additional information when problematic deals risk affecting the security interests of other Member States.
- The system relies on a relatively wide scope for screening intervention, based on criteria of "security" and "public order". While the two terms are not precisely defined, Article 4 lists the factors to be considered when determining whether a transaction qualifies against the two criteria. Some relate to the possible effect of the FDI on the recipient country within the EU: impact on critical infrastructure, access to sensitive technologies, access to personal data, impact on the pluralism of the media. In addition, the verdict is informed by an assessment of the identity of the investor, whether it is backed by a state, and whether there is a risk that it engages in threatening or illegal activities.
- The regulation empowers the Commission to issue opinions when an investment threatens the security or the public order of more than one Member State, or when an investment could undermine an EU strategic project such as Horizon 2020 or Galileo. The Commission does not have the executive power to block transactions

¹ Official Journal of the European Union, Regulation (EU) 2019/452 of the European Parliament and of the Council of 19 March 2019 establishing a framework for the screening of foreign direct investments into the Union, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R0452&from=EN>

or impose conditions. **But its opinions carry weight.** As a result, some cases will necessarily reflect a balance of political forces between the Commission and the Member States that have a stake in the transaction, especially when there is no consensus among the stakeholders. The Member State where the FDI is planned retains the ultimate decision-making power, but will need to take into consideration the interests of other Member States and the bigger EU picture when reaching a conclusion.

The first annual assessment report, released in November 2021, provides important figures on Member States' screening activity. From the entry into force of the regulation to June 2021, a total of 265 transactions triggered a screening procedure – including 90% by only five Member States (Austria, France, Germany, Italy and Spain). Among the 20% of the total that was formally screened, 2% ended with a ban, while 12% was approved with conditions. The rest, 86%, was approved. This confirms the openness of the European economy, and the fact that **blocked transactions are an exceptional development, rather than the norm.**

According to the report, China was in 2020 the third-largest investor in the EU after the US and the UK, accounting for 2.5% of mergers and acquisitions (M&A) transactions and 7.5% of greenfield projects.² This shows the very small number of cases involving Chinese FDI into Europe – and clearly, fewer Chinese cases than American ones. But aggregate numbers do not tell the entire story. The first case underlines how it has become an irreplaceable line of defense for the EU, while the second highlights some of its inherent limitations.

On March 31, 2021, the Italian government blocked the sale of 70% of Milan-based LPE to the Chinese company Shenzhen Inveland Holdings Co.³ LPE produces epitaxy reactors for the semiconductor industry. The case is arguably typical of ongoing dynamics in EU-China technology relations. It is remarkable because the decision by the Italian Council of Ministers was leaked to the media, offering insights into the new practice of investment screening in Europe.⁴ **The leak underlines the role of the Commission as a coordinator of communication between the Member States affected by a particular transaction.** In the case of LPE, Sweden and the Netherlands expressed an opinion alongside the Commission and the Italian

government. The fact that Sweden took part in the European collective action despite not yet having an investment screening legislation is an important reminder of the usefulness of coordination at the level of the Commission.

Epitaxy technology has a history in EU-China technology relations. The world's leader is German company Aixtron, whose attempted takeover by China's Fujian Grand Chip Investment Fund in 2016 was a major wake-up call in Germany and across Europe regarding the need for investment screening. At the time, the deal was blocked by the US, with the Obama administration nullifying the sale of Aixtron's Californian subsidiary.⁵ The US Treasury, as head of the Committee on Foreign Investment in the United States (CFIUS), explained in a statement that “the national security risk posed by the transaction relates, among other things, to the military applications of the overall technical body of knowledge and experience of Aixtron, a producer and innovator of semiconductor manufacturing equipment and technology”.⁶

Explaining the Italian decision, Prime Minister Mario Draghi underlined the “strategic importance” of the semiconductor sector.⁷ But the Italian decision contains two other notable elements of explanation. First, LPE has received European funding as part of Horizon 2020, which is a possible criterion for screening under the regulation. Second, epitaxy has possible military applications and the Chinese investor, Shenzhen Inveland, has significant ties to the arms industry, including as a minority shareholder of Advanced Micro-fabrication Equipment Inc. (AMEC), a company on the US Department of Defense's list of “Communist Chinese Military Companies”.⁸ In sum, the Italian decision combined elements of European research funding, possible military end-use, the nature of the technology and the identity of the investor, and the larger picture of China as a competitor to dominate strategic technologies in the semiconductor sector as a matter of security for Europe.

The second case concerns Mars (HK) Information Technology Co. Ltd.'s purchase of a majority share of 75% in Alpi Aviation. The purchase violated Italy's law governing export of military material and possibly its golden power rule, which gives the Italian government the special power to limit and stop transactions in strategic industries. **The case highlights the challenges of enforcement of existing regulations**

⁵ “US blocks Chinese purchase of German tech firm Aixtron”, *DW*, 3 December 2016, <https://www.dw.com/en/us-blocks-chinese-purchase-of-german-tech-firm-aixtron/a-36625221>

⁶ Department of the Treasury, “Statement of the President's Decision Regarding the U.S. Business of Aixtron SE”, 2 December 2016, <https://www.treasury.gov/press-center/press-releases/Pages/jl0679.aspx>

⁷ “Italy vetoes takeover of semiconductor firm by Chinese company Shenzhen – sources”, *Reuters*, 9 April 2021, <https://www.reuters.com/article/china-italy-semiconductors-idUSL8N2M22LS>

⁸ US Department of Defense, “DOD Releases List of Additional Companies, In Accordance with Section 1237 of FY99 NDAA”, 14 January 2021, <https://www.defense.gov/News/Releases/Release/Article/2472464/dod-releases-list-of-additional-companies-in-accordance-with-section-1237-of-fy/>

² European Commission, “First Annual Report on the screening of foreign direct investments into the Union”, 23 November 2021, https://ec.europa.eu/commission/presscorner/detail/en/ip_21_6226

³ “Italy vetoes takeover of semiconductor firm by Chinese company Shenzhen - sources”, *Reuters*, 9 April 2021, <https://www.reuters.com/article/china-italy-semiconductors-idUSL8N2M22LS>

⁴ Mathieu Duchâtel, “The New Landscape of Investment Screening in Europe”, Institut Montaigne, 21 June 2021, <https://www.institutmontaigne.org/en/blog/new-landscape-investment-screening-europe>

and mechanisms given China's appetite for European military technology and its capacity to identify vulnerabilities.⁹ It suggests a determination by actors in the Chinese arms industry to circumvent European regulations and exploit enforcement difficulties. It is also a reminder that **the Commission must rely on Member States to identify problematic transactions through their own national level.**

The story is indeed an exemplary case of the use of a shell company as a front for a technology acquisition serving China's military ambitions. In 2018, Mars was able to acquire Alpi without attracting the notice of Italian authorities and begin transferring sensitive technology back to China. It was only incidentally, through a separate investigation, that the firm's Beijing links were uncovered. Italian police would go on to determine Mars (HK) Information Technology Co. Ltd. had only registered in Hong Kong two months before the acquisition, and accepted a significant overpayment.¹⁰ The Hong Kong company was in fact a front for two Chinese state-owned companies, a subsidiary of China's Railway giant CRRC and China Corporate United Investment (established in 2016 to invest in Belt and Road Initiative projects).

The Italian policy also determined that the acquisition's goal was "exclusively to acquire technological and manufacturing know-how".¹¹ Alpi Aviation produces the Styx, an unmanned aerial vehicle used for reconnaissance by the Italian Air Force in support of tactical and special operation forces.¹² The Italian police investigated the use of an export certification for a military drone containing fake information about the nature of the product (which was not a "radio-controlled airplane model") and its destination (apparently not an import fair in Shanghai).¹³ In November 2020, the vice-president of CCUI for Europe announced that Alpi Aviation's production was being moved to China.¹⁴ Although the EU legislation has since entered into force, cases such as Alpi's will still prove a major source of risk. Problematic transactions trigger the EU's communication mechanism and the involvement of the Commission and possibly other Member States with a stake in the transaction, but the preliminary step is to identify the transaction at the national level. If identification is missed at the Member-State level, there is little additional security provided by the new regulation.

⁹ Gabriele Carrer, "Italian drone maker under investigation after Chinese takeover", *Decode 39*, 2 September 2021, <https://decode39.com/1906/alpi-aviation-gdf-china/>

¹⁰ "China Bought Italian Military-Drone Maker Without Authorities' Knowledge", *Wall Street Journal*, 15 November 2021, <https://www.wsj.com/articles/china-bought-italian-military-drone-maker-without-authorities-knowledge-11636972513>

¹¹ "Italy investigating sale of military drones group to Chinese investors – source", *Reuters*, 3 September 2021, <https://www.reuters.com/article/italy-china-drones-goldenpowers/italy-investigating-sale-of-military-drones-group-to-chinese-investors-source-idUSL8N2Q52GP>

¹² Source: website of Alpi Aviation, <https://alpiaviation.com/en/strix-df/>

¹³ Danielle Pletka, "What Are the Chinese After? Everything.", *The Dispatch*, 19 November 2021, <https://thedispatch.com/p/what-are-the-chinese-after-everything>

¹⁴ Eliot Chen, "Italy's Drone Drama", *The Wire China*, 26 September 2021, <https://www.thewirechina.com/2021/09/26/italys-drone-drama/>

1.2. Next steps

FDI screening is an important layer of defense against unwanted technology transfers. There are three possible next steps to improve the efficiency of the EU investment screening mechanism.

RECOMMENDATION NO. 1

DG TRADE should conduct or commission a study of enforcement capabilities in all Member States.

There is an issue of capacity at the level of Member States. This is an immediate question of having an even system across Europe and avoiding weak links. The Commission expects 24 EU Member States to have investment screening systems by the end of 2022 – Bulgaria, Croatia and Cyprus will still be missing. Once systems are in place across all Member States, the question will become bureaucratic efficiency and the quality of human resources in place. **Even states with long-standing systems face difficulties in monitoring conditional deals with remedies accepted by companies.** The Commission can play an important role in diffusing best practices, and there is a need for intra-European solidarity to train human resources, but nothing will replace national investment in human capital and in improving institutional arrangements over time.

This study should address two issues in the spirit of improving the European system. First, it should **assess the possibility of providing more resources to the Commission** to help audit the annual FDI reports submitted to the Commission for problematic investments, thus improving its ability to serve as a sort of pan-European safety net. Second, it should assess what the Commission's options are if Member States reject implementing recommendations to block or impose conditions on investments.

RECOMMENDATION NO. 2

The European Commission should raise the inclusion of Japan in the work of the transatlantic working group on investment screening.

There is a question of international cooperation. The inaugural meeting of the Trade and Technology Council lists investment screening as an area of transatlantic coordination.¹⁵ The TTC creates an investment screening working group, planned to meet 3 to 4 times per year to exchange information on investment trends, on industries, on specific technologies but also on trends regarding specific countries. This is a very wide scope. It takes transatlantic investment screening exchanges beyond their usual focus on exchanges on legal and institutional arrangements and the question of best practices in terms of policy tools. This is where the US should not be the EU's exclusive partner when screening transactions linked to Chinese FDI. **Japan, because of its mix of strong bureaucratic capacity, its heavy political focus on economic security and the density of its economic ties with China, could also be a source of information for the EU and its Member States.** The trilateral cooperation format between the US Trade Representative, Japan's Ministry of Economy, Trade and Industry (METI) and the EU Commissioner for Trade could provide a useful umbrella for the EU to complement the TTC but also existing bilateral exchanges with Japan and address issues linked to intangible technology transfers related to FDI.

In addition, it is important to keep in mind that the TTC excludes specific transactions, which will logically remain off-limits as an issue of transatlantic exchanges. But during due diligence investigation, other channels can be mobilized – there are possibly cases where access to US intelligence will be useful for Europe to make decisions based on better information. If this happens, this will be a national responsibility, not one at the level of the EU, using existing intelligence sharing channels – which should be activated at the initiative of the European Member State concerned. This is also an area where cooperation with Japan could help European purposes.

RECOMMENDATION NO. 3

The issue of retroactivity should be inserted on the agenda of a next Foreign Affairs Council meeting on trade, and discussed by trade ministers or equivalents within Member States.

¹⁵ EU-US Trade and Technology Council Inaugural Joint Statement, 29 September 2021, https://ec.europa.eu/commission/presscorner/detail/en/STATEMENT_21_4951

Contrary to the US system, but like Japan's, **the European system relies on notifications and lacks retroactive powers.** Given the difficulties to conduct due diligence, retroactivity could prove a useful feature to block deals or impose conditions post ante. Under the US system, an excepted foreign investor can lose its status of "excepted investor" during the three years following a particular transaction if it no longer meets the requirements for exception.¹⁶

2. Export control

2.1. The state of play

There are four different layers to the question of European export control in relation to China and transatlantic relations:

- licensed transfers to military end-users,
- gaps in lists of dual-use goods that enable Chinese access to emerging technology for its arms industry,
- building a system to prevent transfers enabling human rights violations,
- and the impact on European companies of unilateral extraterritorial action by the United States.

The first two issues are the two sides of the same coin: transfers to military end-users in China. In 2019, China was the second recipient of licensed dual-use technology from the EU, behind the United States.¹⁷ But the issue is less what is licensed than what is not. The context of growing strength of the Chinese arms industry, Military-Civil Fusion and the importance of innovation for the military balance in Asia have altered the parameters of an old issue in EU-Japan-US relations.

European countries license transfers of military technology and equipment to China – for a total value of EUR 655 million in 2019, according to the European Commission.¹⁸

¹⁶ Jonathan Gafni, "CFIUS Treatment of Excepted Countries and Investors", *Linklaters*, 3 February 2020, <https://www.linklaters.com/en/insights/publications/us-publications/2020/january/cfius-treatment-of-expected-countries-and-investors>

¹⁷ European Commission, "Report on the implementation of Regulation (EU) 2021/821 setting up a Union regime for the control of exports, brokering, technical assistance, transit and transfer of dual-use items", 23 November 2021, https://ec.europa.eu/commission/presscorner/detail/en/ip_21_6226

¹⁸ Twenty-Second Annual Report according to Article 8(2) of Council Common Position 2008/944/CFSP defining common rules governing the control of exports of military technology and equipment ST/12082/2020/INIT, [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020XG1211\(03\)&from=EN](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020XG1211(03)&from=EN)

The 1989 Tiananmen arms embargo is not an embargo in legal terms.¹⁹ The declaration, which announces an “interruption by the Member States of the community of military cooperation and an embargo on trade in arms with China”, was adopted by the Council of Ministers before the Maastricht Treaty that created the European Union. As a result, **it only works as a political guideline preventing sales of weapons systems and military technology, but not as an insurmountable barrier to exports of military equipment.** Dual-use licenses are being granted for military end-users. For example, the PLA Navy's 054A frigate is powered by four SEMT Pielstick (now MAN Diesel) 16 PA6V-280 STC diesel engines produced locally under license at Shaanxi Diesel Factory.²⁰ The Type 052D destroyer integrates two MTU 20V 956TB92 diesel engines in addition to its gas turbines.²¹ These exports are conducted in compliance with European export control legislations. Their existence shows the record of exceptions to the spirit of the 1989 declaration.

But while this state of affairs continues, dual-use transfers integrated in large Chinese conventional weapons platforms have become a rather insignificant issue for the East Asian military balance. **The center of gravity of military competition, where export controls can make a difference, has shifted to the military applications of emerging technologies,** a category that still lacks a precise definition and lists.

Like the US and Japan, the EU has moved to revise its approach. Since September 2021, with the entry into force of Regulation 2021/821, EU-China dual-use trade has been conducted in a new legal framework.²² The Regulation has ended a process of five years initiated by the Commission and the Parliament to respond to the fast pace of innovation in dual-use emerging technologies.

The dual-use regulation creates a new avenue for updating European control lists. In practice, the decision of a Member State to deny an export license for an unlisted item can ultimately lead to its inclusion on the European dual-use list. This applies to tech exports to military end-users, but also to denials motivated by “reasons of public security, including the prevention of acts of terrorism or for human rights

considerations”. When a Member State makes use of that disposition, the Commission has to release the new entry publicly. **The system gives Member States a lot of space to define what constitutes “reasons of public security”.** In short, active Member States can diffuse their best practices across Europe.

In addition, the regulation empowers the Commission to adjust the control parameters for the EU's general export authorization. This was previously a legislative process that could take two to three years – three months will now be sufficient. The regulation also includes deemed technology exports, which refer to a transfer within EU borders to a recipient party linked to a third country of concern, thus qualifying as an “export” that increases the technological capacities of the country of concern. Some Member States, such as Germany, were in favor of establishing an autonomous European control list to fill up existing regimes. But too many differences across Member States resulted in a low common denominator: agreeing to a faster and more agile process for updating lists.

Second, there is the question of avoiding transfers to entities responsible for human rights violations, an issue on which both the US and the EU have moved, but not Japan. The revised EU dual-use regulation creates an EU control list for cybersurveillance items. It enshrines the principle of catch-all control for unlisted cybersurveillance items when there is an intention “for use in connection with internal repression and/or the commission of serious violations of human rights and international humanitarian law” (Article 5.1). While it does not expand the definition of dual-use to include cybersurveillance, as was advocated by some, **there is a practical expansion of the human rights criteria to address transfer of surveillance technology but also law-enforcement end-users.**²³ This introduces in the European system a type of transfer risk not covered by the Wassenaar Arrangement, the multilateral export control mechanism for conventional weapons.

How is this likely to affect technology relations with China? This is partly a question of political will and enforcement capacity at the level of Member States to enforce controls, as they retain the executive power to deny licenses. Some EU Member States had started imposing a licensing system to surveillance items before the adoption of the EU regulation – for example Germany, since 2015. And there have already been cases of licenses being denied by Member States on grounds of possible misuse by law enforcement agencies in China.²⁴ The regulation ensures

19 Mark Bromley, Mathieu Duchâtel, Oliver Bräuner, Western Arms Exports to China, *SIPRI Policy Paper no. 43*, January 2015, <https://www.sipri.org/publications/2015/sipri-policy-papers/western-arms-exports-china>

20 “Type 054A (Jiangkai II) Class Frigate”, Naval Technology, <https://www.naval-technology.com/projects/type-054a-jiangkai-ii-class-frigate/>

21 “Luyang-III Class / Type 052D Destroyers”, Naval Technology, 19 April 2017, <https://www.naval-technology.com/projects/luyang-052d-destroyers/>

22 Regulation of the European Parliament and of the Council setting up a Union regime for the control of exports, brokering, technical assistance, transit and transfer of dual-use items (recast), Brussels, 21 April 2021, <https://data.consilium.europa.eu/doc/document/PE-54-2020-INIT/en/pdf>

23 Mark Bromley and Kolja Brockmann, “Implementing the 2021 Recast of the EU Dual-use Regulation: Challenges and opportunities”, EU Non-Proliferation and Disarmament Papers no. 77, September 2021, https://www.nonproliferation.eu/wp-content/uploads/2021/09/EUNPDC_no-77_FINAL-1.pdf

24 Source: Author's interview with senior European export control official, June 2021.

that there will be more, as bureaucratic capacities and political awareness of risks of abuse are increasing across Europe.

But the measurable impact of the regulation on the behavior of law enforcement agencies in China and on their access to surveillance technology is likely to be very limited, given the strength of Chinese tech companies. China simply does not need European technology to build a surveillance state. The case of Hikvision offers a useful lesson. The designation of the surveillance company on the US entity list in 2019 cut its access to foreign semiconductor technology. But semiconductor technology incorporated in Hikvision's systems can be sourced domestically.²⁵ **EU export controls will result in license denials, but the scale of China's domestic market for surveillance systems provides a powerful growth engine for homegrown Chinese technologies.** One may think that the ban on the use of facial recognition technology in public space by law enforcement agencies, advocated by the EU Parliament in October 2021, could impact Chinese domestic law enforcement trends if it leads to actual European legislation.²⁶ Similar discussions are taking place in China to restrict the use of facial recognition and the Chinese Supreme Court has ruled to ensure independent consent by individuals for the collection and use of facial data, but only for commercial operations, not law enforcement.²⁷

And third, there is the issue of extraterritorial application of US measures and their impact on European industrial players. The use of extraterritorial legislation by the United States imposes losses on European industries without consultations, and is, from a commercial perspective, a sovereign tool to give preferential treatments to US companies over foreign competitors – a view largely held among European tech companies. In October 2021, it was reported that the US Department of Commerce approved 301 licenses with a combined value of almost USD 103 billion for exports to Huawei and SMIC (Shanghai-headquartered Semiconductor Manufacturing International Corporation) for the period between November 2020 and April 2021, spanning two different administrations.²⁸ The licensing process for European export under the entity list and Export Administration Regulations is comparatively less smooth. This recognition fuels **the perception, already very**

25 Mathieu Duchâtel, "The Weak Links in China's Drive for Semiconductors", Institut Montaigne, Policy Paper, January 2021, <https://www.institutmontaigne.org/en/publications/weak-links-chinas-drive-semiconductors>

26 Melissa Heikkilä, "European Parliament calls for a ban on facial recognition", *Politico*, 6 October 2021, <https://www.politico.eu/article/european-parliament-ban-facial-recognition-brussels/>

27 "You have a choice: China's top court empowers people to say 'no' to facial recognition use by private businesses", *South China Morning Post*, 29 July 2021, https://www.scmp.com/tech/policy/article/3143023/you-have-choice-chinas-top-court-empowers-people-say-no-facial?module=perpetual_scroll&pgtype=article&campaign=3143023

28 "Huawei and SMIC Scored Billions in U.S. Licenses, Lawmakers Say", *Bloomberg*, 21 October 2021, <https://www.bloomberg.com/news/articles/2021-10-21/huawei-and-smic-scored-billions-in-u-s-licenses-lawmakers-say>

strong in the European industry, that US controls are designed not only to prevent transfers to military end-users in China, but also to kill competition from third countries. The fact that some transfers of European technology need the Department of Commerce's approval and await decisions without explanation or a point of contact, while they would not be treated as dual-use in Europe and do not need licensing, further fuels European frustration regarding American intentions vis-à-vis Europe. This is for example the case of transfers of equipment for the Chinese domestic civilian commercial aircraft.²⁹

2.2. The way forward

The new dual-use regulation marks a departure away from the traditional export control perspective strictly centered on preventing transfers to military end-users. It reflects a new awareness in Europe regarding technology, which at the beginning of the Arab Spring was widely viewed as an empowerment tool for civil societies in authoritarian states, but is now seen as a tool to enforce authoritarian order. In that regard, **the regulation creates political space for common approaches in cyber, human rights and emerging technologies that were not possible previously.** Export control focused on end-users involved in human rights violations is gaining political support across democratic countries. The joint statement signed by Australia, Denmark, Norway and the United States to establish a "voluntary, non-binding written code of conduct around which like-minded states could politically pledge, to use export control tools to prevent the proliferation of software and other technologies used to enable serious human rights abuses" has already received support from France and the Netherlands.³⁰ It will need more widespread support across key European countries, and ultimately at the EU level, and also from Japan to lead to an effective initiative.

What has the potential to have the greatest impact on technology relations with China however is the combination of an improved system conceived to be more agile, and a new emphasis on emerging technologies across Europe. **The regulation creates a new procedure, but a system is what is made of it.** What emerging technologies will be subject to European licensing procedures? How efficient will be licensing authorities when implementing those export controls?

29 Source: interview with senior industry executive, Paris, November 2021.

30 White House, "Joint Statement on the Export Controls and Human Rights Initiative", 10 December 2021, <https://www.whitehouse.gov/briefing-room/statements-releases/2021/12/10/joint-statement-on-the-export-controls-and-human-rights-initiative/>

As part of its enforcement work, the Commission has set up an “Emerging Technology Expert Group” led by DG TRADE. The group has compiled fact sheets listing dual-use technologies in the field of **data analytics and advanced computing, advanced materials, artificial intelligence, additive manufacturing, hypersonic propulsion technologies, quantum technology and semiconductors**.³¹ They are listed for their possible military applications, but also for their possible employment by public security agencies. For example, heat resistant material can improve China’s hypersonic glide vehicle, while AI algorithms have applications in the area of predictive policing by law enforcement agencies. Short of inclusion on control lists, a pragmatic step can be the creation of a watch list for emerging technologies.

RECOMMENDATION NO. 4

Create a trilateral expert working group with the United States and Japan specifically to share information and definitions on emerging technologies, with a view to present non-binding listing recommendations.

The identification of emerging tech in need of control for possible dual-use applications is a critical task for Europe. Bureaucratic efficiency in performing that task will be gained by being informed through in-depth consultations with innovative industrial countries undergoing the same process of defining emerging technology. Of all the working groups created by the Trade and Technology Council, the export control working group is the only one that will include officials from Member States and not only the European Commission. **This highlights the importance of cooperative work on an issue for which the United States and Japan also have knowledge and practices to share, especially when this updating task risks facing roadblocks within the Wassenaar Arrangement.**

Japan has not yet drafted its list of emerging technologies. So far, the Department of Commerce has not produced a list of emerging technologies, despite being legislatively mandated to do so under the Foreign Investment Risk Review Modernization Act (FIRRMA) and the Export Control Reform Act (ECRA).³² There is a possibility that

³¹ European Commission, “Emerging Technologies Developments in the Context of Dual-Use Export Controls”, https://trade.ec.europa.eu/doclib/docs/2021/september/tradoc_159791.pdf

³² Emma Rafaelof, “Unfinished Business: Export Control and Foreign Investment Reforms”, U.S.-China Economic and Security Review Commission, 1 June 2021, https://www.uscc.gov/sites/default/files/2021-06/Unfinished_Business-Export_Control_and_Foreign_Investment_Reforms.pdf

the US will not release a full list, and will work on a case-by-case approach. Of all democratic countries, only Australia has released a list of 63 technologies “critical to national security”, imposing restrictions on exports and on research cooperation.³³

In this context, establishing a forum for discussion on emerging technologies should be a first step. Reaching consensus on non-binding listing recommendations will not be an easy task but having this discussion with the United States and Japan, two countries still in the process of shaping their approaches with regards to listing emerging technologies, is in the interest of Europe – therefore, the process should precede the deliverables.

RECOMMENDATION NO. 5

The EU should coordinate its position with Japan and prepare a joint document estimating the cost for European and Japanese industries of unfair US licensing practices.

A mapping exercise including an estimate of the cost of unilateral measures, which could be carried out by think-tanks, would contribute to reducing the uncertainties facing European and Japanese companies in their global businesses.

To address US extraterritorial action, the EU and EU Member States need to seize all opportunities to raise the issue – **the Trade and Technology Council offers an excellent platform to seek explanation, smooth differences and ultimately obtain a change of behavior of the US towards its allies.** Japan is the best positioned country to work with the EU on this issue, in terms of overall weight as a key US ally, and because being, like Europe, the target of US measures undermines the foundations for cooperation with the US on China policy.

³³ “Australia says 63 areas of technology are critical to national security”, Reuters, 16 November 2021, <https://www.reuters.com/world/asia-pacific/australia-invest-73-mln-quantum-tech-it-beefs-up-critical-areas-2021-11-16/>



ADDRESSING TWO GAPS

1. Beyond multilateralism: what formats for effective cooperation?

1.1. The state of play: the problems with the Wassenaar Arrangement

Since 1996, the avenue for multilateral export control of dual-use items has been the Wassenaar Arrangement. Succeeding the Coordinating Committee for Multilateral Export Controls (CoCom), Wassenaar was created at the end of the Cold War in an international environment in which the US priority was to prevent rogue states from acquiring destabilizing amounts of firepower that would constitute an incentive for aggression.

Is Wassenaar adapted to China's Military-Civil Fusion and its international drive to access dual-use technology? There is no question that it provides a useful multilateral framework to address China's Military-Civil Fusion in the sense that it is the only existing one. But as Wassenaar's Munitions List and Dual-Use Goods List are updated annually at the plenary meeting of the group, can lists keep up with the fast pace of technology innovation?

The answer is clearly negative. The recent cases of introduction of atomic clocks for navigation systems and secure satellite quantum communication have provided a good reminder of how difficult it was to reach multilateral decisions quickly on issues of export control.³⁴ In 2020, no decision was reached at Wassenaar – an outcome partly to blame on the difficulties to hold in-person meetings due to Covid-19, but not only. **Issues of speed are unavoidable in a multilateral export control arrangement that includes Western countries and Russia.** SIPRI lists data retention systems and monitoring centers as examples of cybersurveillance technologies that were placed first on the German export control list before they were

³⁴ Source: Author's online interview with export control officials, September 2021.

included on Wassenaar's and the EU's control lists.³⁵ More recently, in 2020, the US Department of Commerce added software specially designed to automate the analysis of geospatial imagery (an inherent dual-use AI item) to its control list under the Export Control Administration without waiting for an international consensus in Wassenaar.³⁶

Historically, Wassenaar was primarily created to address transfers of weapons systems, not innovation programs and military ambitions that still need access to foreign dual-use technology. The design of the arrangement reflects the assessment that Iraq invaded Kuwait in 1990 because it had accumulated a stockpile of conventional weapons transferred by the West during the Iran-Iraq war. It also reflects a compromise between the American concerns regarding Russian arms transfers to Iran and Russian concerns regarding US arms sales to Saudi Arabia and Israel.

There is no legal obligation for Member States to comply with the export control revisions adopted at the plenaries. **Once a technology is part of the multilateral control list, every government commits to developing a licensing process, but this remains a national competence.** Member States have sixty days to report their munition and dual-use transactions with recipient states.³⁷

Finally, contrary to the Australia Group, the multilateral export control regime for chemical and biological weapons, **the Wassenaar Arrangement does not have an emerging technology working group.** In practice, this is not necessarily an obstacle. Items are introduced by member countries and thus they can choose to introduce emerging and foundational technology items on the agenda without first coordinating through a working group. In the semiconductor sector for example, the Dual-Use List was expanded in 2019 to include computational lithography software designed for the fabrication of extreme ultraviolet (EUV) masks and technology for finishing wafers for 5 nm production.³⁸ But that an emerging technology working group is out of reach does not mean that one would not be useful.

³⁵ Mark Bromley, "Export Controls, Human Security and Cyber-surveillance Technology: Examining the Proposed Changes to the EU Dual-use Regulation", SIPRI, Stockholm, December 2017, <https://www.sipri.org/publications/2017/other-publications/export-controls-human-security-and-cyber-surveillance-technology-examining-proposed-changes-eu-dual>

³⁶ Bureau of Industry and Security, Addition of Software Specially Designed to Automate the Analysis of Geospatial Imagery to the Export Control Classification Number 0Y521 Series, 1 June 2020, <https://www.federalregister.gov/documents/2020/01/06/2019-27649/addition-of-software-specially-designed-to-automate-the-analysis-of-geospatial-imagery-to-the-export>. The case is mentioned in the report of the advisory committee to METI.

³⁷ Austin Lewis, "The Effectiveness of the Wassenaar Arrangement as the Non-Proliferation Regime for Conventional Weapons", Thesis, Freeman Spogli Institute for International Studies, Stanford University, May 2015, <https://searchworks.stanford.edu/view/mz349xm4602>

1.2. The way forward

The problem with Wassenaar has been used as a justification by US officials to defend the recourse to unilateral measures, which can include extraterritorial jurisdiction – for example in the case of the Huawei regime.³⁹ **European export control officials consider unilateral measures with an extraterritorial application as undermining the predictability and the stability of the overall system, which are important assets for states and companies.**⁴⁰ This efficiency problem should be nuanced but not ignored. On the one hand, even at the peak of the Trump administration's campaign targeting China's high-tech sector, the US administration never gave up efforts to update multilateral control lists through Wassenaar.⁴¹ In other words, **Wassenaar is always the end game.** And in fact, the EU has accepted the notion of preparatory work at non-multilateral level by including export control as an item of the Trade and Technology Council. But on the other hand, the EU-US bilateral format, even with officials from all EU Member States present in the export control working group, will not solve issues facing Europe as it lists technologies emerging from the European industrial ecosystem. There is a need for other sources of information and comparison, and there is a need for flexibility.

RECOMMENDATION NO. 6

The EU and EU Member States should proactively adopt the principle of “the technology decides the international cooperation framework”.

Many emerging and critical technologies are only manufactured in a small subset of the Wassenaar member states. Spending valuable time getting support from all Wassenaar members is thus questionable when these countries do not even have

38 In 2019, six items were placed on Wassenaar's list:

- Hybrid additive manufacturing (AM)/computer numerically controlled (CNC) tools (2B001),
- Computational lithography software designed for the fabrication of extreme ultraviolet (EUV) masks (3D003),
- Technology for finishing wafers for 5nm production (new ECCN 3E004),
- Digital forensics tools that circumvent authentication or authorization controls on a computer (or communications device) and extract raw data (5A004.b),
- Software for monitoring and analysis of communications and metadata acquired from a telecommunications service provider via a handover interface (5D001.e), and
- Sub-orbital craft (9A004.h, 9A515.a).

Source: <https://www.bis.doc.gov/index.php/federal-register-notice/17-regulations/1619-federal-register-notice-2020#fr62583>

39 Authors' exchange with senior American export control official, July 2021.

40 Authors' exchange with senior European export control official, July 2021.

41 Authors' exchange with senior American export control official, July 2021.

the technology and would not necessarily be promulgating state level controls even if adopted by the full committee. Therefore, at the minimum the countries that need to enforce controls to prevent leakage are those who own the technology.

A pragmatic idea is to be found in Japan's expert circles. In June 2021, METI's advisory committee released a new report on national security export control, advocating improving the efficiency of multilateral control regimes through small groups of like-minded and stakeholder states in given technologies acting faster and more decisively.⁴² The report highlights some key problems of the existing multilateral regimes. First, in international regimes that include 30 to 40 members, decisions on control items are made on a consensus basis. Second, all states face the impact of extraterritorial application of national export control regulations – themselves caused by frustration regarding the lack of effectiveness of multilateral regimes. The report recommends that the Japanese government should play **a leading role in establishing complementary frameworks by working with a limited number of like-minded countries, with the goal to disincentivize unilateral action.** Such frameworks need to work technology by technology, instead of focusing on the broad picture. The nature of the technology should decide which are the participating nations – stakeholding nations only. The results of work within these smaller groups should be shared with the existing regimes.

Of these possible smaller groups, **the EU-Japan-US format or groups that include particular Member States should play an important role**, and the work done to co-define emerging technologies will be an essential preliminary step to operationalize the idea of “the technology decides the international cooperation framework”.

2. Covering research and education cooperation

2.1. The state of play

How to prevent intangible technology transfers to military end-users in China through research and education cooperation? This area of public debate is slowly surfacing in Europe. Cooperation with China in science and technology is important for Europe,

42 “産業構造審議会 通商・貿易分科会安全保障貿易管理小委員会中間報告”, (Industrial Structure Council, Trade Subcommittee: Interim Report of the Security Trade Management Subcommittee), 10 June 2021, https://www.meti.go.jp/shingikai/sankoshin/tsusho_boeki/anzen_hosho/pdf/20210610_1.pdf

but anecdotal evidence shows that transfers to military end-users have taken place across the continent through such cooperation. Although there is no quantitative data indicating the level of severity of the issue, from a regulatory and policy perspective, **what matters is the lack of a strong EU initiative to expand controls of dual-use technology to include intangible transfers through research and education, and to create intra-European convergence on that front.**

On the Chinese side, accessing European scientific and engineering knowledge through education and research exchanges is a state policy and a natural expansion of China's Military-Civil Fusion Strategy. According to a report published by the Australian Strategic Policy Institute, between 2007 and 2018, the PLA has sponsored the training of more than 2,500 military scientists and engineers in universities and research centers in Australia, the EU, the UK, the US and Japan. Many cases of deception were found among them, where trainees hid their affiliation of origin.⁴³ **A follow-up report underlined that the problem of intangible technology transfers with a military end-use was not limited to collaboration with defense universities**, such as Beihang University in Beijing, Harbin Institute of Technology or Northwestern Polytechnical University in Xi'an. Military-Civil Fusion has resulted in many signed defense contracts between China's State Administration of Science and Technology of National Defense (SASTIND) and universities for defense-related laboratories and projects, with various tiers of security credentials being granted by SASTIND depending on the sensitivity of the projects.⁴⁴

The 2017 opinion of the State Council on Military-Civil Fusion underlines the key role that universities have been asked to play in support of the Chinese arms industry, inviting in its general principles the arms industry, military scientific research units, the Chinese Academy of Sciences, colleges and universities, and other civilian units, including private enterprises, to form a "strong joint force of close cooperation and coordinated advancement" (协同推进的强大合力). The opinion also plans "key defense technology innovation alliance and industry/academia cooperation" (组建国防关键技术创新联盟, 开展产学研用合作).⁴⁵ **This practice creates a challenge of due diligence regarding the real end-users of cooperation projects.**

43 Alex Joske, "Picking flowers, making honey, the Chinese military collaboration with foreign universities", ASPI, 30 October 2018, <https://www.aspi.org.au/report/picking-flowers-making-honey>

44 Alex Joske, "The China Defense Universities Tracker", ASPI, 25 November 2019, <https://www.aspi.org.au/report/china-defence-universities-tracker>

45 State Council Opinion no. 91, 2017, 国务院办公厅关于推动国防科技工业军民融合深度发展的意见, http://www.gov.cn/zhengce/content/2017-12/04/content_5244373.htm

Chinese military universities have ongoing cooperation programs with European technology academic institutions. For instance, Beihang University runs partnerships with the Technischen Universität Wien (Vienna) and the Technical University of Madrid. Hangzhou Dianzi University also works with the Technischen Universität Wien, in the field of artificial intelligence.⁴⁶ A report reveals that in 2020, 25 out of the 113 academic exchanges in place between Slovakia and China are linked to the PLA, in one way or another.⁴⁷ In Denmark, a Professor at the University of Copenhagen was conducting biotechnology research on the exposure of monkey brains to high altitude. The research, which was commissioned by a PLA research institute, serves to improve military operations on high plateaus.⁴⁸

But in line with the development above regarding the links between controls over technology transfers and economic competitiveness, there is also an issue of intangible transfers of research outcomes to industrial players. In 2021, a French media reported that the French General Directorate for Internal Security (DGSI) expressed concerns over IFREMER's relations with Chinese academic entities in a confidential note in 2018, which raised the risks of "acquisition of know-how and technology of French academic research potentially undermining French national economic interests".⁴⁹ **New European funding streams for research aim at seeking guarantees that the outcomes of R&D will be industrialized in Europe, and not in third countries.** How to operationalize that idea is one of the key questions to which the EU Chips Act is proposing answers.⁵⁰

Those exchanges do not occur in a legal vacuum. Export control regulations and investment screening systems cover research and education cooperation to some extent.

The EU dual-use regulation warns against the role that researchers and persons transmitting dual-use items electronically can inadvertently play in transfers of technology to military end-users. Article 13 states that "Academic and research institutions face distinct challenges in export control due to, inter alia, their general

46 "Hangzhou Dianzi University helps lead Beijing's hunt for European AI expertise", *Intelligence Online*, 2 September 2021, <https://www.intelligenceonline.com/government-intelligence/2021/09/02/hangzhou-dianzi-university-helps-lead-beijing-s-hunt-for-european-ai-expertise,109688567-art>

47 Matej Šimalčík, Adam Kalivoda, "China's inroads into Slovak universities. Protecting academic freedoms from authoritarian malign interference", Center European Institute of Asian Studies, December 2020, <https://ceias.eu/chinas-inroads-into-slovak-universities/>

48 "Monkey-brain study with link to China's military roils top European university", *Japan Times*, 19 November 2021, <https://www.japantimes.co.jp/news/2021/11/19/world/university-research-chinese-military/>

49 Program: https://www.francetvinfo.fr/replay-magazine/france-2/complement-d-enquete/complement-d-enquete-du-jeudi-25-fevrier-2021_4284643.html

50 Mathieu Duchâtel, *Semiconductors in Europe: the return of industrial policy*, Institut Montaigne, March 2022.

commitment to the free exchange of ideas, the fact that their research work often involves cutting edge technologies, their organizational structures and the international nature of their scientific exchanges. Member States and the Commission should, where necessary, raise awareness among the academic and research community and provide them with tailored guidance to address those distinct challenges”.⁵¹ It adds that controls should be implemented in line with multilateral export regimes.

As a follow-up to the regulation, the European Commission has published a Recommendation on internal compliance programs for controls of research involving dual-use items under Regulation (EU) 2021/821.⁵² **The Recommendation is conceived as a practical framework for researchers, and lists several research cooperation scenarios under which an export license is required:**

- When a visiting researcher from a third country returns home with access to (or in possession of) the controlled dual-use item acquired through courses, collaborations, or works on research involving dual-use items inside customs territory of the Union.
- When conference material carried in paper, on laptop or other physical carriers such as USB stick contains controlled dual-use technology (but not when presented orally at a conference).
- When a publication includes technology that meets the thresholds for dual-use control and would require an export authorization (but export control authorities need to rely on the due diligence of research organizations to screen prepublications in sensitive research areas).

The recommendation considers a red flag situation when for a stated civilian end-use, the partner/end-user is actually “tied to the military, the defense industry or a governmental research body in a country with an arms embargo”.

Intangible technology transfers through research and education cooperation to military end-users are also covered by investment screening. **The EU investment screening regulation lists a number of EU funded projects and programs which can trigger FDI screening, including Horizon Europe.** Similarly, but at the national level, the 2019 French decree regarding Foreign Direct Investment

⁵¹ Regulation (EU) 2021/821, op. cit.

⁵² “Commission Recommendation (EU) 2021/1700 on internal compliance programmes for controls of research involving dual-use items under Regulation (EU) 2021/821 of the European Parliament and of the Council setting up a Union regime for the control of exports, brokering, technical assistance, transit and transfer of dual-use items”, 15 September 2021, <https://www.esu.ulg.ac.be/publication-of-the-eu-icp-guidance-for-research-involving-dual-use-items/>

⁵³ Direction générale du Trésor, « Les secteurs d'activités dans lesquels les investissements sont soumis à autorisation préalable », <https://www.tresor.economie.gouv.fr/services-aux-entreprises/investissements-etrangers-en-france/les-secteurs-d-activites-dans-lesquels-les-investissements-sont-soumis-a-autorisation-prealable>

expands screening control to R&D activities in dual-use technology and critical technology (defined as including cybersecurity, AI, robotics, semiconductor, quantum technology, energy storage and biotech).⁵³

To complement those regulations, the EU and some Member States have taken more specific steps to better monitor and control intangible technology transfers:

- Article 73 of the regulation establishing the new Horizon Europe (2021-2027) makes clear that “for actions related to Union strategic assets, interests, autonomy or security, the work program may provide that the participation can be limited to legal entities established only in Member States or to legal entities established in specified associated or other third countries in addition to Member States” and underlines the importance of risk assessment when engaging in international cooperation.⁵⁴
- Guidelines to academic institutions are another approach to addressing risks linked to research and education cooperation. In recent years, Germany, the Netherlands and Sweden have developed such guidelines, with the German and Dutch ones being specifically focused on cooperation with China, while Sweden's is country-neutral. The German and the Swedish guidelines pay considerable attention to the risk of appropriation of civilian technologies for military and law enforcement purposes.⁵⁵

2.2. The way forward

RECOMMENDATION NO. 7

Mapping military-relevant technology transfers occurring via education and research cooperation across Europe.

⁵⁴ Regulation (EU) 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination, and repealing Regulations (EU) No 1290/2013 and (EU), No 1291/2013, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R0695>

⁵⁵ Ingrid d'Hooghe, Jonas Lammertink, “Towards Sustainable Europe-China Collaboration in Higher Education in Research”, Leiden Asia Centre, October 2020, <https://leidenasiacentre.nl/report-towards-sustainable-europe-china-collaboration-in-higher-education-and-research/>

The first step to refine European policy responses is to conduct in-depth research and collect accurate data on the intensity of intangible technology transfers through education and research cooperation. The previous section shows that currently, there is only anecdotal evidence in Europe, which either comes from leaks by security services wishing to raise awareness, or from investigative research. At the minimum, **it could be Europe's own mapping of military end-users in countries of concern, including China.** The list of military end-users does not have to be public but it should be shared with the foreign ministries of Member States for consular authorities to screen visa applications. As a needed intermediary step, the European Commission should compile a list of transfers that have occurred in the past and a list of ongoing risky cooperation projects.

RECOMMENDATION NO. 8

Towards a specific European regulatory framework.

With its recommendation on export control compliance and a new approach to international cooperation as part of Horizon Europe, the European Union is taking steps to create a more solid framework preventing the exploitation of Europe's openness. Guidance to academic institutions should come from the governments of Member States. **The European Union has a role to initiate a European-wide process that promotes convergence and best practices, along with export control and investment screening regulations.** The creation of a compliance officer position in the governing board of academic institutions, following the Japanese model, should be considered when designing the future European framework. Going beyond intangible technology transfers, such an European-wide framework may also address, in more general terms, the question of international academic cooperation, including its impact on academic integrity and freedoms in Europe and the risk of interference.

CONCLUSION

STRENGTHENING EUROPE IN THE BROADER CONTEXT OF COMPETITION FOR TECHNOLOGY SUPREMACY

There is no question that the EU's ability to prevent unwanted technology transfers to China has increased in recent years, as a result of a stricter and more mature toolbox of defensive measures. The new dual-use export control regulations and the investment screening mechanism strengthen considerably the capacity of Member States and the Commission to act and prevent transfers to military end-users, entities and individuals in law-enforcement positions presenting risks of being engaged in human rights abuses. This policy paper:

- Underlines a number of practical steps that can be taken by the European Union to reinforce its existing set of control procedures,
- Highlights a need to strengthen controls to military end-users through intangible technology transfers,
- And advocates trilateral cooperation with the United States and Japan for the purpose of making the European system more efficient.

The logic of efficiency commands that Europe builds a policy framework of selective securitization, not a complete revision of trade and investment relations with China under a framework of economic security. Restrictions are not contradictory with openness – the statistics so far demonstrate that problematic transactions are exceptional. Of course, the success of a defensive system is also measured by its capacity to deter attempts at acquisitions that would trigger a response: this is the so-called “chilling effect”. In a general context of diminishing Chinese FDI in both Europe and the United States, it is difficult to measure the deterring impact of new defensive measures. And to a large extent, **preventing acquisitions by China or critical technology exports to China is also a stimulus for the PRC to further develop its own innovation capacities and to reach as quickly as possible a degree of self-reliance, including for advanced sectors of its economy.** But the strength of this argument has considerably decreased as a result of the leadership of Xi Jinping, who has clearly indicated that it is in China's national interest to develop these technologies domestically.

As the EU and Member States work to increase the efficiency of their control policies, including by working with the United States and Japan, it is important to note that no control policy will by itself stop China's drive for technology acquisition. **Common and coordinated approaches by the EU, Japan and the US are therefore important to reduce the risks of loopholes being exploited**, especially when it comes to emerging technologies, for which a common (and evolutive, with regular updates) control list appears to be a crucial step.

How does a policy framework of selective securitization differ from an approach centered on economic security? The term "economic security" is close to taboo in most European policy circles, where it is interpreted as dangerous protectionism. The European Commission advocates the notion of "open strategic autonomy" as a guiding principle when building defensive tools with the idea that international openness is in the best interest of Europe. Europe should look at Japan's economic security legislation for a pragmatic approach under the umbrella of "economic security", but that does not undermine openness. Currently, the bill is set to focus on four pillars only: beefing up the security of key infrastructure, boosting supply chain stability, facilitating public-private cooperation on developing cutting-edge technology, and keeping patents on sensitive technologies undisclosed. This narrow focus on technology competitiveness, that includes protective measures and positive support for the Japanese industry, is far from closing down Japan to the world.

The regular complaints coming from Europe and Japan regarding the commercial advantages that the US Department of Commerce provides to US companies by using extraterritorial export control is a major issue of trust between the US, the EU and Japan. A trilateral framework for technology transfers controls should not ignore this issue. **Only by reducing differences and mistrust on that question can the three parties work together on an agenda of technological competition with China** centered on preserving military superiority and coming to terms with China's active competition to demonstrate the superiority of its Leninist system and state capitalism over liberal democracies. In this competition, controls over technology transfers will play a role but not the decisive one – innovation and the capacity to industrialize R&D will be more crucial.

A necessary complement to these defensive measures is therefore a set of encouragement incentives to innovation in sectors where a technology race is on, and industrial policies to improve our capacities and diminish our dependency on supply chains owned by one country, and singularly by China. As our defensive measures rise in intensity and breadth, they will also diminish our capacity to persuade China to end its centralized, subsidy-based support for innovation, and to trust the market,

whether its own or the global marketplace, to deliver results. As much as the market needs to retain its essential role, **China's drive for technology acquisition in military, dual-use, and foundational or emerging technologies forces Europe to consider support other than by market forces**. Control and support are the two sides of the same coin when it comes to technological power. The policy paper *Semiconductors in Europe: the return of industrial policy*, simultaneously published by Institut Montaigne, explores the case of European support for its semiconductor sector, a foundational technology with widespread and key applications in many industrial sectors, and a central enabler of the ongoing digital transformation of our societies and economies.

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The opinions expressed in this policy paper are not necessarily those of the above-mentioned persons or of the institutions that they represent.

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The EU and its Member States have been significantly improving their defensive toolbox, from investment screening to export control. But despite remarkable accomplishments, the toolbox is still incomplete and Europe's current system contains exploitable loopholes.

This policy paper reviews Europe's existing tools, their genesis, their achievements but also their limits, and identifies two gaps that need to be addressed: the shortcomings of current multilateral formats of cooperation for tech transfer controls, and the lack of a strong EU initiative on transfers happening through research cooperation with China.

The United States and Japan are the most active global players when it comes to regulating technology transfers. The policy paper argues that Europe should develop trilateral cooperation with the US and Japan, to maximize the efficiency of its own toolbox. For some issues, such as the impact of extraterritorial sanctions on European companies, cooperation with Japan can strengthen the European position within the transatlantic Trade and Technology Council. The paper provides eight policy recommendations to improve the effectiveness of the European system.

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