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The geopolitical competition between China and the U.S. in new technologies

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Abstract

In the new world scenario, in which there is no longer a dominant global power, and we are witnessing a serious crisis of international organisations and institutions created to ensure peace, security, and prosperity after World War II, technological competition is a strategic one: It can be a key factor to achieve both economic growth and military superiority. This particularly applies to digital technologies, including AI, and global infrastructure networks. Unlike other competitors of the U.S., the PRC is currently in the position to take up this challenge, using methods that a state abiding more strictly by a free-market economy and rule of law would not be able to or would not wish to adopt. While the related risks are high, also in terms of security, the U.S. and its allies should try and win the competition. However, their economies are nowadays deeply intertwined with the Chinese one. To this end, proper internal legislation and practices should be studied and implemented alongside efforts to use the still-existing international mechanisms, such as those in the WTO frame.

Keywords: PRC, China, semiconductors, chips, artificial intelligence, digital technologies, critical minerals

1. The main elements of the current technological competition

In the Cold War era, the definition of “superpower” applied to the only two states whose military might was vastly superior to that of all other states. They were also competing on general influence, enacting and proposing two very different political and economic systems. However, a key factor that brought the loss of the superpower status to one of them was the technological gap, which in the 1980s grew so rapidly that the Soviet Union could no longer hide its backwardness in many areas. In the military sphere, for example, although keeping its nuclear deterrence capacity, it could not compete with the highly technological **Strategic Defense Initiative** launched by the Reagan administration in 1983, which – if fully implemented – would have also undermined the doctrine of **Mutual Assured Destruction**.

Four decades later, the ever-increasing pace of technological evolution, especially in AI applications, has an even stronger influence over the balance of power among countries, making the competition in this field likely the most strategic one.

A White House fact sheet on the 2022 bipartisan **CHIP and Science Act** explains quite clearly how urgent is for the United States to meet this challenge: “America invented the semiconductor, but today produces about 10 per cent of the world’s supply—and none of the most advanced chips. Instead, we rely on East Asia for 75 per cent of global production.” Therefore, the legislation would “unlock hundreds of billions more in private sector semiconductor investment across the country, including production essential to national defence and critical sectors,” to “strengthen American manufacturing, supply chains, and national security” and “to keep the United States the leader in the industries of tomorrow, including nanotechnology, clean energy, quantum computing, and artificial intelligence.”¹

1.1 The race for technological leadership as a base to achieve military superiority

When in May 2015 Xi Jinping, the Secretary-General of the Chinese Communist Party, and the then Premier Li Keqiang announced the “Made in China 2025” initiative, the declared main goal was to upgrade the industrial level of the country from “world’s factory” of cheap low-tech goods to main producer of high-level technological items. It identified the semiconductor industry as a key element of the plan, as well as priority sectors such as AI, 5G, aerospace, high-tech shipping and oceanic engineering, energy and power generation, biotechnology, advanced pharmaceuticals and medical devices, high-speed railways, and electric vehicles.

¹ **CHIPS and Science Act Will Lower Costs, Create Jobs, Strengthen Supply Chains, and Counter China**, The White House, August 09, 2022: <https://www.whitehouse.gov/briefing-room/statements-releases/2022/08/09/fact-sheet-chips-and-science-act-will-lower-costs-create-jobs-strengthen-supply-chains-and-counter-china/>

Presented as a “quality revolution”, although still facilitated by very low labour costs, the strategy was supported by huge state investments, with special attention to international scientific and academic collaboration. However, it became soon quite clear that it could rely also on “intellectual property acquisition and theft, cyber operations, talent recruitment, and illicit procurements”, and that it was implemented “to become a world S&T superpower and to use this technological superiority for economic, political, and military gain.”²

China is determined to acquire advanced and emerging technologies from the United States and other countries, to achieve global leadership in artificial intelligence and “the world’s most technologically sophisticated military systems” to be able to employ a systems-destruction warfare strategy. This would include attacks on command-and-control centres to shut down enemy operational systems. Meanwhile, “Beijing has invested in large numbers of ground-based theater missiles, third- and fourth-generation aircraft carrying advanced standoff missiles, diesel submarines capable of dominating regional waters, counter space and cyber capabilities, and an increasingly advanced nuclear arsenal.”³

Of particular concern is the “Military-Civil Fusion” strategy adopted by the People’s Republic of China to develop or acquire advanced and emerging technologies, which, in addition to driving economic and military modernization, support its ability “to conduct destabilizing activities in Asia and beyond, strengthen its tools for internal repression, and enhance its global disinformation operations.”⁴

The latest **Annual Threat Assessment** of the U.S. Intelligence Community notes, among others, that China is making progress also in a field that can have significant developments in the next future: advanced chips for cryptocurrency mining. As for the People’s Liberation Army (PLA), strictly dependent on the Chinese Communist Party, the report points out that it’s “developing and deploying new technologies to enhance its capability to process and use information at scale and machine speed, allowing decision-makers to plan, operate, and support cross-domain unconventional and asymmetrical fighting”, as well as “researching various applications for AI, including support for missile guidance, target detection and identification.”⁵

Chinese asymmetrical fighting strategy would certainly include massive hacking. In January 2024, speaking at the U.S. Congress before the House Select Committee on the Chinese Communist Party, FBI Director Christopher Wray warned that Chinese hackers were “ramping up an extensive hacking operation geared at taking down the United States’ power grid, oil pipelines and water systems in the event of a conflict over Taiwan”, and “positioning on American infrastructure in preparation to wreak havoc and cause real-world harm to American citizens and communities, if or when China decides the time has come to strike.”⁶

² The Policy Planning Staff, Office of the U.S. Secretary of State, **The Elements of the China Challenge**, Washington, DC, November 2020, 11: <https://www.state.gov/wp-content/uploads/2020/11/20-02832-Elements-of-China-Challenge-508.pdf>

³ *Ibid.*, 15.

⁴ Otto S., “Protecting Critical Tech”, **State Magazine**, 03 March, 2023: <https://statemag.state.gov/2024/03/0324feat01/>

⁵ **2024 Annual Threat Assessment of the U.S. Intelligence Community**, February 5, 2024: <https://www.odni.gov/files/ODNI/documents/assessments/ATA-2024-Unclassified-Report.pdf>

⁶ Glenn Thrush and Adam Goldman, “China Is Targeting U.S. Infrastructure and Could ‘Wreak Chaos,’ F.B.I. Says”, **New York Times**, 31 January, 2024: <https://www.nytimes.com/2024/01/31/us/politics/fbi-director-china-wray-.html>

1.2 Access to critical minerals and advanced semiconductors

Minerals are defined as “critical” when they serve an essential function in one or more modern technologies and there is a high risk of supply chain disruption. Their list is subject to assessments made by governments; as for the United States, it currently includes 50 minerals – among which copper, lithium, nickel, cobalt, tungsten, gallium and germanium – and rare earth elements. Demand for them has dramatically increased in recent years, especially for their applications in clean energy technologies (wind turbines, solar panels and electric vehicles) and electronics, as some of them are essential in the manufacturing and production of semiconductors.

For many critical minerals, the world’s largest producer is China, which also controls the supply chain of other ones. It accounts for approximately 60% of worldwide production and 85% of processing capacity. In 2022, it produced 98.18% of gallium, 90% of magnesium, and 84.52% of tungsten.

It’s not surprising, therefore, that the United States has a strategic dependence on China for 80% of critical minerals; 20/25% of semiconductor chips (while 92% depend on Taiwan for the most advanced ones); 60% of consumer electronics, including telecommunications equipment; 75% of lithium-ion batteries and 100% for many pharmaceuticals and medical supplies.⁷ The issue has been addressed several times also by the EU, which is constantly updating its own list of critical materials and, among else, in 2023 assessed that China was providing “100% of the EU’s supply of heavy rare earth elements.”⁸

In February 2021, President Biden signed Executive Order 14017 “America’s Supply Chains”, directing the Government to undertake a comprehensive review of critical supply chains “to identify risks, address vulnerabilities, and develop a strategy to promote resilience”. On June 8, 2021, the White House released a 250-page report assessing supply chain risks and vulnerabilities in the manufacturing of semiconductors, high-capacity batteries, critical materials and minerals, pharmaceuticals, and active pharmaceutical ingredients.⁹

According to a report by the U.S. State Department, in 2020, China accounted for “50% of global steel and aluminium production, 70% of consumer electronics manufacturing capacity, 90% of consumer drone production, 45% of shipbuilding production”.¹⁰ As for integrated circuits, in 2021 the production in China reached a peak of 359.4 billion pieces; in the following year, it was of 324.1 billion pieces, with a 9,8% decrease compared to the previous year¹¹. According to China’s Ministry of Industry and Information Technology, in 2023 the output grew by 6.9%, reaching 351.4 billion. However, China had still to import 479.5 billion pieces, accounting for 10.8% less than in 2022.¹²

Against this backdrop, it is understandable why it is considered crucial for the U.S. and its allies to ensure that Beijing will not get full control of Taiwan’s production. In particular, “almost all the most advanced processors” come from Taiwan Semiconductor Manufacturing Company (TSMC), which “has around 55%

⁷ *Strengthening the Global Semiconductor Supply Chain in an Uncertain Era*, Boston Consulting Group and Semiconductor Industry Association, April 2021: https://www.semiconductors.org/wpcontent/uploads/2021/05/BCG-x-SIA-Strengthening-the-Global-Semiconductor-Value-Chain-April-2021_1.pdf

⁸ *Critical raw materials*, EU Commission official website: https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials_en

⁹ *Building Resilient Supply Chains, Revitalizing American Manufacturing, and Fostering Broad-Based Growth*, 100-Day Reviews under Executive Order 14017, White House, June 2021.

¹⁰ *The Elements of the China Challenge*, cit., 11.

¹¹ “China’s Integrated Circuits in the Past Decade”, *China Legislation Standard*, December 1, 2023: <http://www.cnstandards.net/index.php/chinas-integrated-circuits-in-past-decade/>

¹² “China’s Jan semiconductor sales growth outpaces global level, as self-sufficiency improves amid U.S. clampdown”, *Global Times*, March 5, 2024: <https://www.globaltimes.cn/page/202403/1308245.shtml>

of the global market for contract chip fabrication.”¹³ In 2022, according to the Observatory of Economic Complexity of the MIT Media Lab, China imported integrated circuits primarily from Taiwan (using the official Beijing’s denomination, “Chinese Taipei”), South Korea, Singapore, and Malaysia.¹⁴

1.3 The use of geopolitical power projection to set global rules and standards

In October 2023, while presenting its “Global AI Governance Initiative”, the PRC displayed its usual series of rhetorical periphrases (“consensus through dialogue and cooperation”, “to benefit humanity and contribute to building a community with a shared future for mankind”, “common values of peace, development, equity, justice, democracy, and freedom), before stating what it really matters for its goals: that China opposes “drawing ideological lines or forming exclusive groups to obstruct other countries from developing AI” and “creating barriers and disrupting the global AI supply chain through technological monopolies and unilateral coercive measures.”¹⁵ Then, it directly calls for the support, in the UN system, of tens of states whose vote in any resolution or election for key officers of global organisations can be used for its advantage: “We should increase the representation and voice of developing countries in global AI governance, and ensure equal rights, equal opportunities, and equal rules for all countries in AI development and governance. Efforts should be made to conduct international cooperation with and provide assistance to developing countries, to bridge the gap in AI and its governance capacity. We support discussions within the United Nations framework to establish an international institution to govern AI.”¹⁶

Beijing has now the capacity to invest a huge dose of hard power to support its ambitions, including among others, the transformation of global governance architectures and international organisations. Threat to use armed forces, development assistance (with little care for the fact that the assigned budget is managed by authoritarian regimes or leaders), creation or funding of infrastructures through the **Belt and Road Initiative**, and grants of billion-dollars credits that will be difficult to repay are among the tools used by the PRC to this end. Meanwhile, Beijing tends to take leadership in several diplomatic platforms, such as the BRICS, the Group of 77 (currently, 134) “developing countries” at the United Nations, and the Non-Aligned Movement. PRC citizens are currently heads of the International Telecommunications Union (ITU), the International Civil Aviation Organization (ICAO), the United Nations Industrial Development Organization (UNIDO), the Food and Agriculture Organization (FAO), and the World Health Organization. According to the interpretation of the US Office of the Secretary of State, “Over the long run, the CCP views international organizations as an opportunity to shield the party’s abusive development practices and egregious human rights record from criticism, and to gradually adjust global norms, standards, and institutions to advance its authoritarian goals.”¹⁷

When we look at the PRC’s participation in the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC), we observe that “it has taken a much greater leadership role in standards-drafting technical committees in recent years.”¹⁸ In this way, a risk is that

¹³ Miller Ch., “The Chips That Make Taiwan the Center of the World”, *Time*, October 5, 2022: <https://time.com/6219318/tsmc-taiwan-the-center-of-the-world/>

¹⁴ <https://oec.world/en/profile/bilateral-product/integrated-circuits/reporter/chn>

¹⁵ Ministry of Foreign Affairs of the PRC, “Global AI Governance Initiative”, October 20, 2023: https://www.mfa.gov.cn/eng/wjdt_665385/2649_665393/202310/t20231020_11164834.html

¹⁶ *Ibid.*

¹⁷ *The Elements of the China Challenge*, cit., 26.

¹⁸ China in International Standards Setting, the U.S.-China Business Council, February 2020, 2: https://www.uschina.org/sites/default/files/china_in_international_standards_setting.pdf

“China’s standards policies can amplify the market-distorting effects of its broader industrial policies like **Made in China 2025**, which provide disproportionate government support for Chinese companies in an effort to create globally competitive national champions.”¹⁹

1.4 Controlling vital infrastructures on land, space, and subsea domains

In 2013, the Chinese government adopted the global infrastructure development strategy known as the **Belt and Road Initiative** (BRI). Officially named “Silk Road Economic Belt and 21st-Century Maritime Silk Road Development Strategy”, it foresees programs in about 150 countries, including railways, highways, pipelines, logistical hubs, and huge ports facilities, thus designing a much wider network than the historical Silk Road.

In 2015 China also announced – in connection with the BRI – a “Digital Silk Road” program, in which its infrastructure investment is linked to the adoption by recipient countries of Chinese technologies. It provides “support to Chinese exporters, including many well-known Chinese technology companies, such as Huawei,” and offers “to improve recipients’ telecommunications networks, artificial intelligence capabilities, cloud computing, e-commerce and mobile payment systems, surveillance technology, smart cities, and other high-tech areas.”²⁰

As for the space domain, China’s Manned Space Agency officially announced, in May 2023, that it plans to complete a mission to land a person on the moon by 2030. While “a provision in the U.S. law that finances NASA bans direct cooperation with the Chinese space agency or Chinese-owned companies”, for this project “China signalled that it will cooperate with Russia.”²¹ China is also developing its own low-earth orbit (LEO) satellite Internet service, as well as counter space-weapons capabilities intended, according to the US, to “target U.S. and allied satellites.”²²

In February 2024, President Biden signed an executive order aimed at protecting U.S. vessels, harbours, ports, and waterfront facilities by countering Chinese cyber threats and espionage. The order, among else, aims to reduce supply chain vulnerabilities due to Chinese cranes operating at U.S. ports (which could dangerously be controlled from remote locations) and grants the U.S. Coast Guard new powers to respond to malicious cyber activity.²³

A new area of competition is also the subsea domain, which plays a very important role in transcontinental communication. The ocean floors are currently crossed by nearly 1.4 million kilometres of metal-encased fibre optic cables, mostly supplied and installed by companies from France, the U.S., and Japan. Consecutive U.S. administrations have blocked international subsea cable projects by Chinese companies involving U.S. investment, “because of concerns of espionage and worries about what Beijing might do to disrupt strategic assets operated by Chinese companies in the event of a conflict”. This could, however, “fracture the global internet as Chinese companies start building their own cable networks elsewhere,”

¹⁹ *Ibid.*, 7.

²⁰ “Assessing China’s Digital Silk Road Initiative”, Council on Foreign Relations, 2020: <https://www.cfr.org/china-digital-silk-road/>

²¹ Wang V., “China Announces Plan to Land Astronauts on Moon by 2030”, *The New York Times*, 29 May, 2023: <https://www.nytimes.com/2023/05/29/world/asia/china-space-moon-2030.html>

²² *2024 Annual Threat Assessment of the U.S. Intelligence Community*, cit.

²³ *Executive Order on Amending Regulations Relating to the Safeguarding of Vessels, Harbors, Ports, and Waterfront Facilities of the United States*, White House, February 21, 2024: <https://www.whitehouse.gov/briefing-room/presidential-actions/2024/02/21/executive-order-on-amending-regulations-relating-to-the-safeguarding-of-vessels-harbors-ports-and-waterfront-facilities-of-the-united-states/>

eventually arriving to “create a system where you don’t have connectivity, with a quasi-cold war, eastern bloc versus the west.”²⁴

1.5 The U.S. administration’s export control policies

In general terms, the United States uses export controls to protect national security interests and promote foreign policy objectives, also in the frame of international control regimes designed to prevent the proliferation of weapons of mass destruction, destabilizing accumulations of conventional weapons, and dual-use (civilian-military) technologies. However, in recent years “the United States has leveraged export controls to address national security concerns posed by the People’s Republic of China, including by implementing controls on the sale of advanced semiconductors with military capabilities to the PRC.”²⁵

The Bureau of Industry and Security (BIS) of the U.S. Department of Commerce is in charge of compiling an “Entity List” of “foreign individuals, companies, and organizations deemed a national security concern, subjecting them to export restrictions and licensing requirements for certain technologies and goods”²⁶ in addition to the general Export Administration Regulations.

More than 600 Chinese entities (of which about 150 under the Biden administration) have been included in this list for activities contrary to U.S. national security and foreign policy interests. For instance, 28 companies were added to the list in March 2023 for “acquiring or attempting to acquire U.S.-origin items in support of programs for the People’s Liberation Army and providing goods and services to customers on the BIS Entity List, leading to the possibility for diversion”. The BIS named, among else, Suzhou Centec Technology Co., Ltd. for participating in and hosting “military and military-civil fusion exhibitions and summits,” while specifically advertising military end uses for its products, and four companies “due to their contributions to ballistic missile programs of concern.”²⁷

In October 2023, the BIS “imposed additional license requirements on exports to more than 40 additional countries that present a heightened risk for diversion to China,” in order to “address potential transshipment by non-PRC companies purchasing chips for resale to China.”²⁸

²⁴ Gross A., Heal A., Campbell C., Clark D., Bott I., de la Torre Arenas I., “How the U.S. is pushing China out of the internet’s plumbing”, *Financial Times*, June 13, 2023: <https://ig.ft.com/subsea-cables/>

²⁵ US Department of State, **Export Controls Policy**: <https://www.state.gov/nonproliferation-export-controls/>

²⁶ Bureau of Industry and Security: <https://www.bis.gov/entity-list>

²⁷ U.S. Government Federal Register, Additions and Revisions of Entities to the Entity List, March 6, 2023: <https://www.federalregister.gov/documents/2023/03/06/2023-04558/additions-and-revisions-of-entities-to-the-entity-list>

²⁸ Bureau of Industry and Security, **Public information on export controls imposed on advance computing and semiconductor manufacturing items to the People’s Republic of China (PRC)**, November 6, 2023: <https://www.bis.doc.gov/index.php/policy-guidance/advanced-computing-and-semiconductor-manufacturing-items-controls-to-prc>

2. Free-market economy in a liberal democracy vs. party-state command economy: a SWOT analysis

In order to assess the US positioning vis a-vis China this section employs a SWOT analysis framework. It thus aims to evaluate the Strengths, Weaknesses, Opportunities, and Threats inherent in the US system compared to the Chinese one. The SWOT analysis, a strategic planning tool commonly used in business and management, offers a structured approach to assess internal and external factors affecting an entity's performance. By applying this framework, we can thus discern the unique advantages and challenges the US system is faced with.

2.1 Strengths: freedom of scientific research, open public debate, innovative culture, and positive industrial competitiveness

While contrasting the decision-making processes between single-party systems like that of the People's Republic of China (PRC) and multi-party democracies such as the United States, it's evident that the former often allows for swifter decision-making by its leader. Conversely, democratic systems like the U.S. may seem sluggish, marked by frequent halts, and shifts in direction. Despite potential bureaucratic delays, the openness of societies fosters an environment where independent actors can pursue innovation across various domains, particularly evident in information and advanced technologies. On the other hand, more centralized control can lead to situations where state objectives diverge from the profit-driven motives of individual businesses. Consequently, state-controlled firms may prioritize geopolitical objectives over economic returns, potentially stifling competitiveness and innovation.

A significant parameter is the number of researchers employed in research and development (R&D) for technological innovation. According to the United Nations Conference on Trade and Development – UNCTAD, the U.S. in 2019 (last data available) employed in this sector 4,821 persons per million inhabitants; in 2020, the European Union 3,092, Japan 5,104, South Korea 5,331 – and China only 1,585.²⁹

²⁹ UNCTAD, *Technology and Innovation Report 2023*: https://unctad.org/system/files/official-document/tir2023_en.pdf

2.2 Weaknesses: lack of government investments and subsidies, and of unified control planes

In evaluating the weaknesses of the United States' free-market economy within a liberal democracy, it's essential to consider the potential downsides of minimal state intervention, a hallmark of his economic system. While the free-market economy, with as little as possible guidance and control by the state, has over centuries been regarded as an advantageous system, in times of deep crisis (such as the **Great Depression** of 1929-1939, or even the **Global Financial Crisis** of 2007-2008) a well-balanced governmental intervention is necessary. During such crises, a lack of timely and effective governmental intervention can exacerbate economic downturns and prolong recovery periods. Moreover, in an increasingly interconnected global economy, the absence of robust regulatory mechanisms may leave the U.S. susceptible to unfair trade practices by foreign powers, undermining both economic stability and international relations.

In contrast, China operates under a system where economic decision-making is centralized within the Communist Party of China (CCP). State-owned enterprises enjoy government-backed financial security, even when facing unsustainable debt levels. Private firms, particularly those deemed strategically significant by the state, including those in the field of new technologies, receive extensive support and incentives, often at the expense of foreign competitors.³⁰

To try and contrast this gap, the U.S. administration has started to include in its policy a program of subsidies and incentives in key sectors where the risk of giving China a quasi-monopoly is too high. In this way, the U.S. aims to strengthen economic and national security. In particular, to strengthen its supply chain and reduce the reliance on foreign sources of chips, the federal government has been distributing \$39 billion in subsidies as an incentive for companies "to revitalize domestic manufacturing of semiconductors." According to some analysts, that should put the United States "on track to produce roughly 20% of the world's most advanced logic chips by the end of the decade."³¹ Along the same lines, in April 2024, the U.S. Department of Commerce and TSMC Arizona Corporation, a subsidiary of Taiwan Semiconductor Manufacturing Company Limited, signed a preliminary memorandum of terms to provide up to \$6.6 billion in direct funding under the **CHIPS and Science Act**, supporting 10 times bigger TSMC's investment for three factories of the most advanced semiconductors in Phoenix, Arizona.³²

³⁰ **Countering Unfair Chinese Economic Practices and Intellectual Property Theft**, Carnegie Endowment for International Peace, April 25, 2022:

<https://carnegieendowment.org/2022/04/25/countering-unfair-chinese-economic-practices-and-intellectual-property-theft-pub-86925>

³¹ Ngo M., "Chipmakers Seek More Than \$70 Billion in Federal Subsidies", **The New York Times**, February 26, 2024: <https://www.nytimes.com/2024/02/26/us/politics/semiconductors-chips-us-subsidies.html>

³² **Biden-Harris Administration Announces Preliminary Terms with TSMC, Expanded Investment from Company to Bring World's Most Advanced Leading-Edge Technology to the U.S.**, U.S. Department of Commerce, April 2024: <https://www.commerce.gov/news/press-releases/2024/04/biden-harris-administration-announces-preliminary-terms-tsmc-expanded>

2.3 Opportunities: constructive interaction with the other most developed economies

In a 2023 ranking of the world's most technologically advanced countries and territories, China is only in the 38th position.³³ Number 1 is South Korea (where “consumer electronics giants invest heavily in research and development, while its citizens combine advanced technological skills with an innovative culture”); the U.S. is second, Taiwan third, followed by other Western countries – such as Israel and Japan. According to Getzoff, the reasons for China's positioning reside in the fact that while it “invests significantly into research & development for critical technologies, it lacks the ability to utilize its population for greater technological advancement.”³⁴

In this context, a source of opportunities for the United States could be to foster the cooperation with its most technologically advanced allies. The cooperation between the United States and the European Union is of special importance in the field of new technologies, and not only for research and production. The two parties are “strongly committed to driving digital transformation and cooperating on new technologies based on their shared democratic values, including respect for human rights”, and in June 2021 established the **EU-US Trade and Technology Council** as a forum to coordinate approaches to key global trade, economic, and technology issues and to deepen transatlantic trade and economic relations based on these shared values.³⁵ In March 2023, in a joint statement, President Biden and the EU Commission President von der Leyen stressed the will to deepen the cooperation “on diversifying critical mineral and battery supply chains, recognizing the substantial opportunities on both sides of the Atlantic to build out these supply chains in a strong, secure, and resilient manner”, in order “to reduce unwanted strategic dependencies.”³⁶ In this context, it is also worth recalling that the sole supplier in the world of extreme ultraviolet (EUV) lithography systems, necessary for high-volume manufacturing of advanced logic and memory microchips, is the ASML Holding of the Netherlands, which holds the 8th position in this ranking.

The U.S. is engaged in trilateral coordination with Japan and South Korea and has agreements on securing the critical-mineral supply chains and coordinating the approaches to semiconductor incentives also with Canada and other countries.³⁷ At the same time, the U.S. intends to “dispel the notion that America's most important partnerships are only with established economies.” To this end, it has “designed the elements of an ambitious regional economic initiative, the Indo-Pacific Economic Framework”, and has been “negotiating chapters with thirteen Indo-Pacific nations that will hasten the clean-energy transition, implement tax fairness and fight corruption, set high standards for technology, and ensure more resilient supply chains for critical goods and inputs.”³⁸

³³ Getzoff M., “Most Technologically Advanced Countries In The World 2023”, *Global Finance* magazine, December 1, 2023: <https://gfmag.com/data/non-economic-data/most-advanced-countries-in-the-world/>

³⁴ *Ibid.*

³⁵ **EU-US Trade and Technology Council**, official website of the European Commission: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/stronger-europe-world/eu-us-trade-and-technology-council_en

³⁶ **Joint Statement by President Biden and President von der Leyen**, The White House, March 10, 2023: <https://www.whitehouse.gov/briefing-room/statements-releases/2023/03/10/joint-statement-by-president-biden-and-president-von-der-leyen-2/>

³⁷ **Remarks by National Security Advisor Jake Sullivan on Renewing American Economic Leadership at the Brookings Institution**, April 27, 2023: <https://www.whitehouse.gov/briefing-room/speeches-remarks/2023/04/27/remarks-by-national-security-advisor-jake-sullivan-on-renewing-american-economic-leadership-at-the-brookings-institution/>

³⁸ *Ibid.*

2.4 Threats: infiltration of undercover agents and industrial espionage

Finally, in the analysis of the threats faced by the US, the risks of espionage should be mentioned. According to Bateman, the Chinese government “carries out large-scale cyber espionage for the benefit of domestic firms, and shields Chinese companies from accountability when they conduct their own cyber espionage.”³⁹ Besides, it “employs government agencies, organizations, commercial entities, individual entrepreneurs, Chinese expatriates, Chinese and foreign researchers to attain its espionage goals,” and “threaten citizens with severe punishment if they do not help with espionage efforts.”⁴⁰ Moreover, according to the author, there are “at least 500 Chinese talent programs designed to conscript academic and professional expertise from the West into scooping up information and technology to serve China’s national development.”⁴¹

In July 2020, Christopher Wray, Director of the FBI stated in a public speech that his organization was “opening a new China-related counterintelligence case about every 10 hours.” describing China as “engaged in a whole-of-state effort to become the world’s only superpower by any means necessary.”⁴² Meanwhile, through talent recruitment campaigns like the **Thousand Talents Program**, China pays Chinese scientists in American universities “to secretly bring knowledge and innovation back to China—including valuable, federally funded research.”⁴³

³⁹ *Countering Unfair Chinese Economic Practices and Intellectual Property Theft*, cit.

⁴⁰ Eftimiades N., “The 5 Faces of Chinese Espionage: The World’s First ‘Digital Authoritarian State’”, *Breaking Defense*, 22.10.2020: <https://breakingdefense.com/2020/10/the-5-faces-of-chinese-espionage-the-worlds-first-digital-authoritarian-state/>

⁴¹ *Ibid.*

⁴² Christopher Wray, *The Threat Posed by the Chinese Government and the Chinese Communist Party to the Economic and National Security of the United States*, July 7, 2020: <https://www.fbi.gov/news/speeches/the-threat-posed-by-the-chinese-government-and-the-chinese-communist-party-to-the-economic-and-national-security-of-the-united-states>

⁴³ *Ibid.*

3. The weakened role of the WTO

When, on December 11, 2001, the People’s Republic of China became the 143rd member of the World Trade Organization, after 15 years of negotiations, its protocol of accession set a series of obligations under general WTO agreements and additional China-specific commitments, which were deemed necessary for a process of transition from a “socialist market economy” towards a full market economy. More than 20 years later, the PRC doesn’t appear to have shared core WTO’s values such as fair competition, openness, and transparency, which are threatened by “serious challenges, most notably nonmarket economic practices and policies.”⁴⁴

In February 2024, the Office of the United States Trade Representative issued its **2023 Report to Congress on China’s WTO Compliance**, which details the administration’s assessment of the PRC membership in the organization. The report confirms the long record of China in violating, disregarding and evading existing WTO rules. China still “embraces a state-led, non-market approach to the economy and trade”, which has increased over the past decade, and “the mercantilism that it generates has harmed and disadvantaged U.S. companies and workers, as well as companies and workers of other WTO Members, often severely. As is well-documented, the Chinese government and the CCP routinely intervene in the market using a wide array of non-market policies and practices, both to provide artificial competitive advantages to Chinese industries and enterprises and to actively disadvantage foreign industries, enterprises and workers.”⁴⁵

Over the years, both the U.S. and China initiated disputes using the WTO’s dispute settlement mechanism, alleging violations of specific commitments. China has been called by the U.S. to respond in 23 cases, and the U.S. by China in 18 cases.⁴⁶ However, the mechanism, which include consultations, recommendations, and arbitration, deals only with detailed specific issues (for instance, the imposition by China of additional duties to certain products originating in the United States, or the U.S. tax credits under the 2022 **Inflation Reduction Act**). The system does not address as a whole the fact that U.S. and other foreign enterprises “are competing not only against Chinese enterprises but also against the Chinese state,” while China – in spite of WTO principles and rules – “is using its state-led, non-market approach to the economy and trade in ways designed to secure the dominance of Chinese enterprises, both in the China market and in global markets.”⁴⁷

⁴⁴ *Remarks by National Security Advisor Jake Sullivan on Renewing American Economic Leadership at the Brookings Institution, cit.*

⁴⁵ Unites States Trade Representative, **2023 Report to Congress on China’s WTO Compliance**, February 2024, 2: <https://ustr.gov/about-us/policy-offices/press-office/press-releases/2024/february/ustr-releases-annual-report-chinas-wto-compliance>

⁴⁶ **Disputes by members**, official WTO website: https://www.wto.org/english/tratop_e/dispu_e/dispu_by_country_e.htm#chn

⁴⁷ Unites States Trade Representative, **2023 Report to Congress on China’s WTO Compliance, cit.**, 2-3.

4. Conclusions

The PRC's ambition to build a new world order of which it would be at the centre, supported by authoritarian and aggressive regimes such as those ruling Russia and Iran, presents evident threats not only to its neighbours, which are at risk of direct military aggression but also to the international rules-based order as a whole. For this reason, in the global strategic competition, where new technologies have a primary and increasing role among a wide range of factors, the United States should be able to count on the full support and political alignment of many like-minded countries, most of them with a high level of economic, scientific, and technological development. At the same time, it must secure access to the supply chain of relevant critical materials also in certain developing countries.

While the U.S. administration has been progressively adopting significant measures to confront China's policies, such as limiting exports of sensitive technology to China and intensifying the related counterintelligence activities, the other democratic states based on the rule of law should adopt a coordinated comprehensive response to the common challenge. In this perspective, a clear stance has been recently taken by the EU, whose Foreign Affairs Council in May 2023 agreed to "treating simultaneously China as a partner, competitor and systemic rival, depending on the issue," and "reducing strategic risks and vulnerabilities." As summarized by Josep Borrell, High Representative of the EU for Foreign Affairs and Security Policy, "China has constructed a narrative subordinating fundamental rights to the right to development", which the EU must counter; the trade relations are unbalanced, due to China's deliberate choices and policies; European companies face persistent obstacles and discriminatory practices; and "the EU faces a growing risk of excessive dependencies on certain products and critical raw materials." The answer requires "the diversification and reconfiguration of EU value chains, a more effective export control system, the control of inbound investment and possibly outbound investment, and the smart use of the anti-coercion instrument."

The United States and the EU are aligned also for the policy about Taiwan, respecting the "One China" principle while considering unacceptable any forced change of the status quo. This may have extremely serious implications in case of a military attack on the island by the PRC, but such a threat, made increasingly evident by Beijing statements, military exercises and violations of Taipei's airspace, is already inducing hi-tech companies to move part of the production of chips and of the assembly of PCs, servers and components from Taiwan to other countries, such as Vietnam, Thailand, India, and Mexico.

Matter of concern is also Beijing's initiatives in cyberspace governance, as its strong representation in the managing bodies of the International Organization for Standardization, the International Electrotechnical Commission, and the International Telecommunication Union aims to influence standards related to information communications technology such as satellites, AI, and network equipment.

The PRC is “using data exploitation and technology in the same way that one might use weapons on the field of battle, seeking to achieve strategic goals and undermine its opponent’s will and capacity to resist.”⁴⁸ In this context, special challenges to cybersecurity are presented by AI. Besides its integration in complex IT systems, with related potential vulnerabilities, AI-generated fake images or voices can be used for new kinds of disinformation and influence campaigns – included, among else, in electoral processes. The U.S. and its allies and partners should pay particular attention to this, knowing that Beijing could be using vast information operations to deceptively promote its narratives worldwide and distort foreign information environments.

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⁴⁸ McNeil S., “China’s Data War Against the U.S.”, American Purpose, November 30, 2023: <https://www.americanpurpose.com/articles/chinas-data-war/>

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