

The Devolution of Export Controls: Rethinking Their Use in Technological Competition

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Abstract

This article examines recent U.S. efforts to deploy export controls as a tool for technological competition with China. The article suggests that this shift may fall short of achieving the desired objectives and risks diverting attention and resources from export controls as a key tool of nonproliferation. There are several challenges related to identifying and controlling emerging technologies and building multilateral consensus around China-focused trade controls. Recommendations for deploying other tools are proposed for competing with China.

Keywords

Technology competition, United States, nonproliferation, China, emerging technologies, Entity List, export controls

Introduction

The United States has long sought to restrict and license trade in “strategic” and military related items to achieve national security and foreign policy goals. Over the past 50 years, the objectives and foci of export controls, both domestically and internationally, have shifted in response to geopolitical realities and security concerns. Following the end of the Cold War, export controls moved away from a focus on economic containment to nonproliferation of Weapons of Mass Destruction (WMD). These controls enjoyed broad multilateral and international support.

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However, the latest efforts by the Trump and now Biden administrations to shift the focus of export controls from preventing WMD and military goods proliferation to impeding China's technological advancement risks undermining the former with little to show for the latter. Export controls are an important tool for keeping sensitive military enabling technologies from dangerous groups and adversaries but diverting significant policy attention to use trade controls for competing with China in areas of technological innovation (outside of those that are clearly of military significance and supported multilaterally) carries significant foreign policy and national security risks. U.S. policy-makers should carefully calibrate China-focused trade controls and instead rely on different tools of statecraft and policy for the emerging technological and economic competition with China. Recent efforts to promote technological innovation via industrial policy and investment in critical sectors as represented by the CHIPS Act are a step in the right direction.

This article begins by reviewing how export controls have evolved from the Cold War. Next, it explains why the shift away from export controls focused on preventing the spread of WMD and dual-use trade to controlling emerging technology trade with China may fail to achieve the desired policy results. The article examines several of the challenges that this new shift to controlling emerging technologies faces, especially as it relates to restricting trade with China. It also considers the problem of using the U.S. Department of Commerce's Entity List as part of this wider conflict with China. The article concludes with recommendations for the policy community.

Since U.S. policy-makers seem equally concerned with China's technology acquisition from the standpoint of economic competition, recommendations emphasize employing other tools for competition with China. The U.S. should refocus on using and strengthening export controls as a tool of nonproliferation -- keeping dangerous weapons and related goods and components from being accessed by rogue states such as Russia, state sponsors of terror, such as Iran, and terrorist groups. U.S. partners and much of the international community will also be more supportive of these export controls.

Evolution of Export Controls

During the Cold War period, the United States and its allies developed and implemented export controls designed to impede Soviet and other communist states' access to sensitive military-enabling technologies and items. Following World War II, the U.S. and NATO allies sought to coordinate export control policy and control lists through an international body known as the Coordinating Committee for Multilateral Export Controls (COCOM). Arguably, these COCOM controls met with some success in limiting Soviet and other communist state access to strategic technologies and goods.² The controls were relatively successful as advanced technologies of

2 The United States worked with allies through the Coordinating Committee on Multilateral Export Controls (COCOM). See, for example, Cecil Hunt, "Multilateral Cooperation in Export Controls: The Role of Cocom," *University of Toledo Law Review*, Vol. 14, No. 4 (1983), pp. 1285-1298. Also, for history on U.S. efforts to regulate trade to the Soviet Union, Michael Mastanduno, "Trade as a Strategic Weapon: American and Alliance Export Control Policy in the Early Postwar Period," *International Organization*, Vol. 42 (1988), pp. 121-50.

the period largely emerged in the United States and Western Europe. For example, Western controls on telecommunications equipment meant that Moscow was extremely limited in terms of its ability to handle long distance phone calls well into the latter part of the 1980s.³

As the Cold War waned, the United States and its allies shifted attention away from Soviet containment to preventing so-called “rogue states” from accessing materials and technologies necessary for making WMD.⁴ The proliferation of WMD was viewed by U.S. policy-makers as a leading threat to national and international security. These nonproliferation export controls served to slow states like Iran, Pakistan, Saddam’s Iraq, Libya, and Syria from acquiring key materials and technologies for various WMD programs. The nonproliferation export controls established by the United States and nonproliferation regime partners also bolstered international norms and taboos surrounding the development of nuclear, chemical, and biological weapons. During the late 1980s and 1990s, the United States also worked with other key supplier countries to strengthen a set of multilateral export control regimes which helped define export guidelines and control lists of items useful for chemical, biological, and nuclear weapons as well as missiles and related technology.⁵

In the aftermath of the Cold War, the United States also garnered support from its allies along with former Eastern Bloc countries which introduced new export control laws and regulations on dual-use trade. The United States provided significant foreign assistance to countries, including Russia, in dealing with the “loose nukes” challenge by securing nuclear materials and developing modern export control laws and regulations.⁶

Following the attacks of September 11, 2001, the United States then shifted its policy attention to threats posed by terrorist organizations. The greatest threat to national security was perceived to be a terrorist organization acquiring and using a nuclear, chemical, or biological weapon.⁷ This threat was recognized and supported by other member states of the United Nations Security Council, which passed United Nations Security Council resolution 1540 (2004) calling upon all UN member states to thwart non-state actors in acquiring WMD, including

3 Michael Mastanduno, *Economic Containment: CoCom and the Politics of East-West Trade* (Ithaca: Cornell University Press, 1992), p. 1. Allegedly, Moscow could only handle six incoming international calls in 1987.

4 Gary K. Bertsch and Richard T. Cupitt, “Nonproliferation in the 1990s: Enhancing International Cooperation on Export Controls,” *The Washington Quarterly*, Vol. 16, No. 4 (1993), pp. 53-70, DOI: 10.1080/01636609309477721.

5 The multilateral export control regimes include the Nuclear Suppliers Group, the Missile Technology Control Regime, the Australia Group, and the Wassenaar Arrangement. See Seema Gahlaut, “Multilateral Export Control Regimes: Operations, Successes, Failures, and the Challenges Ahead,” in Daniel Joyner ed. *Non-Proliferation Export Controls: Origins Challenges, and Proposals for Strengthening* (Abingdon: Routledge, 2006).

6 For background on U.S. efforts in nonproliferation export controls, see Scott Parrish & Tamara Robinson, “Efforts to Strengthen Export Controls and Combat Illicit Trafficking and Brain Drain,” *The Nonproliferation Review*, Vol. 7, No. 1 (Spring 2000), pp.112-124. Also see Arms on the Market.

7 This threat featured prominently in the U.S. National Security Strategy of 2002, Section V, at <<https://georgewbush-whitehouse.archives.gov/nsc/nss/2002/nss5.html>>.

by instituting export controls on WMD-related materials.⁸ There was widespread international support for this resolution, and progress was made by dozens of countries, especially in Asia, in implementing new export controls.⁹ The United States supported the development of these more modern export controls by providing legislative support, training, and technical assistance.¹⁰ U.S. agencies were even successful in helping China enhance its ability to implement export controls on nuclear, chemical, and biological weapons technologies – recognizing that China’s cooperation in nonproliferation was essential.¹¹

A Shift to China and Emerging Technologies

With the Trump and now Biden administrations, U.S. national security and foreign policy attention appears to have shifted away from countering proliferation and terrorism to countering China – chiefly over concerns that China is exploiting U.S.-origin technology to advance militarily, unfairly competing with U.S. and foreign companies, and undermining human rights (e.g., through the use of surveillance technology). This move appears to herald a return to a Cold War paradigm of containment – this time focused on China and its pursuit of advanced technology. U.S. officials are seeking to deploy export controls to help ensure U.S. and allied leadership in advanced technologies that are “force multipliers” and to maintain not only a relative advantage over adversaries in advanced technologies, but to maintain “as large as lead as possible.”¹²

Although the Biden administration has set forth an expanded role for export controls in targeting China, the policy foundation was set by Congress which passed a new export control law – the Export Control Reform Act of 2018 (ECRA), moved in part by concerns over China. The Export Control Reform Act (ECRA) (Section 1751)) introduced new objectives of export control, namely “... To ensure national security controls are tailored to focus on those core technologies and other items that are capable of being used to pose a serious national security threat to the United States.” The legislation further established that U.S. national security requires that “... the United States maintain its leadership in the science, technology, engineering, and

8 United Nations Security Council Resolution 1540, S/RES/1540, New York, April 2004.

9 Scott A. Jones, “Current and Future Challenges for Asian Nonproliferation Export Controls,” *East Asian Review*, Vol. 15, No. 2 (2003), pp. 3-26, <<https://sites.miiis.edu/tradecontrols2010/files/2010/01/jones.pdf>>.

10 Most U.S. assistance was provided through the U.S. Department of State’s Export Control and Related Border Security Assistance Program (EXBS). See EXBS Fact Sheet, <<https://www.state.gov/export-control-and-related-border-security-assistance-exbs/>>.

11 For example, the International Nonproliferation Export Control Program (INECP) at the Department of Energy’s National Nuclear Security Administration (NNSA) created a working group with the Chinese Atomic Energy Authority and provided training to China Customs in identifying dual-use items. NNSA also sponsored outreach to industry in China to facilitate the introduction to internal compliance programs. See INECP brochure of 2008, <https://www.energy.gov/sites/prod/files/migrated/nnsa/2017/11/f42/INECP_Brochure.pdf>.

12 Jake Sullivan, Global Emerging Technologies Summit, September 16, 2022, <<https://www.whitehouse.gov/briefing-room/speeches-remarks/2022/09/16/remarks-by-national-security-advisor-jake-sullivan-at-the-special-competitive-studies-project-global-emerging-technologies-summit/>>.

manufacturing sectors, including foundational technology that is essential to innovation.”¹³ These efforts were again motivated by concerns about China’s policies aimed at leading in areas of advanced technology such as artificial intelligence and information technology.¹⁴

The Trump and now Biden Administrations also sought to specifically limit trade with China-based end-users considered to be national security risks. In particular, the Administrations developed new lists of Chinese entities ostensibly linked to the People’s Liberation Army (PLA) and added more Chinese companies to the Commerce Department’s Entity List.¹⁵ Congress has meanwhile taken further steps to tighten technology trade with China. In 2021, Congress introduced a slew of new bills seeking to target Chinese behavior and specifically its technological ambitions. Many of these bills include provisions to strengthen export controls on trade with China, including the China Technology Transfer Control Act (H.R. 1131), the Strategic Act (S.687), and the Eagle Act (H.R. 3524).

Despite bipartisan consensus on China, U.S. executive branch efforts to identify and regulate emerging technologies have faltered. There are both practical as well as bureaucratic challenges. For example, Section 1758(a)(2)(B) of ECRA requires that the interagency effort take into account:

“i) the development of emerging and foundational technologies in foreign countries;

ii) the effect export controls imposed on emerging and foundational technologies may have on the development of such technologies in the United States; and

iii) the effectiveness of export controls on limiting the proliferation of emerging and foundational technologies to foreign countries.”

These considerations require consultation with many in industry and academia that are wary of such new controls and analysis that is inherently complex given the novelty of the technology itself.

One of the basic challenges faced was how to distinguish emerging technologies from foundational technologies. Little guidance was provided by Congress and the policy community

13 See Title XVII subtitle B (may be referred to as the Export Control Reform Act of 2018) section 1751 of the 115th Congress Public Law 232, John S. McCain National Defense Authorization Act for Fiscal Year 2019, at <<https://www.congress.gov/bill/115th-congress/house-bill/5515/text>>.

14 For example, section 1719 of Public Law 232, John S. McCain National Defense Authorization Act for Fiscal Year 2019 requires an analysis of China’s foreign direct investment in the United States, including “..the extent to which those patterns of investments align with the objectives outlined by the Government of the People’s Republic of China in its Made in China 2025 plan.”

15 In June 2021, the U.S. Department of Defense released a list of Chinese military companies in accordance with Section 1260H of the National Defense Authorization Act at <<https://www.defense.gov/News/Releases/Release/Article/2645126/dod-releases-list-of-chinese-military-companies-in-accordance-with-section-1260/>>.

struggled to define clear boundaries. Ultimately, the Commerce Department decided the distinction was artificial and chose to lump both categories of technologies into a new category “1758 Technologies” in reference to Section 1758 of ECRA which requires the Secretary of Commerce to impose controls on emerging and foundational technologies essential to U.S. national security.¹⁶

Many in Congress have complained about how slow this process has been.¹⁷ Despite sweeping new export controls on semiconductors and related manufacturing equipment to China, some in Congress remain unhappy with the scope of efforts to identify new technologies and new end-users of concern in China. As a result, some Republican lawmakers are proposing legislation that would move export control licensing to the Department of Defense in hopes of a tougher stance on China.¹⁸

Why Export Controls on Emerging Technologies May Not Succeed in Slowing China’s Technology Acquisition

Export controls, when targeted and supported by other major supplier countries, can play an important role in impeding the acquisition of advanced weapons and slowing the spread of nuclear, chemical, and biological weapons to state and non-state actors. However, even with multilateral support and backing, they are imperfect tools that may not stop a determined adversary with adequate resources.¹⁹

Even less should be expected of any unilateral U.S. export controls on emerging technology directed at China in terms of slowing China’s technological advancement. First, there are profound challenges with trying to identify and then regulate technologies that are not yet militarily significant. Second, the United States will likely find it difficult building multilateral agreements with other major countries on the technologies to be regulated and on using export controls to thwart China’s technological advances. Finally, Chinese institutions are already leading in many areas of emerging technology, and the ecosystem for global development of emerging technologies means that no one country or even a handful will have great success in controlling most of the critical technologies of the future. There are some exceptions – like in the area of advanced semi-conductors- but this may be the exception rather than the rule.

16 See Title XVII subtitle B (may be referred to as the Export Control Reform Act of 2018) section 1751 of the 115th Congress Public Law 232, John S. McCain National Defense Authorization Act for Fiscal Year 2019, <<https://www.congress.gov/bill/115th-congress/house-bill/5515/text>>.

17 There has been widespread critique by members of Congress of BIS. See, for example, the letter from the China Task Force, on October 22, 2021 to Gina Raimondo, Secretary of Commerce, <<https://gop-foreignaffairs.house.gov/wp-content/uploads/2021/10/CTF-Letter-to-Sec.-Raimondo-on-Export-Control-Actions.pdf>>.

18 See HR 9241: Prioritizing National Security in Export Controls Act of 2022, <<https://www.govinfo.gov/content/pkg/BILLS-117hr9241ih/pdf/BILLS-117hr9241ih.pdf>>.

19 U.S. Congress, Office of Technology Assessment, Export Controls and Nonproliferation Policy, OTA-ISS-596 (Washington, DC: U.S. Government Printing Office, May 1994), p. 11, <<https://ota.fas.org/reports/9408.pdf>>.

China is not like the Soviet Union of the past, which trailed the West technologically and economically. The globalization of supply chains means that “the horses have already left the barn” and efforts to control many technologies may falter.

The Challenge of Identifying Emerging Technologies with National Security Significance

To date, the Department of Commerce’s Bureau of Industry and Security (BIS) along with other U.S. agencies involved in export control have struggled to identify specific technologies that are truly essential to national security – and thereby worthy of inclusion in control lists. The “representative technology categories” considered by BIS to be “emerging technologies” were largely a reflection of China’s *Made in China 2025 (MIC 2025)* policy which seeks to promote Chinese leadership in high technology and reduce dependence on foreign technology.²⁰ Some members of Congress and the policy community are concerned with how China will leverage technological advances in these advanced technologies to support military development. There is also concern with China’s military-civil fusion (MCF) which makes it difficult to keep technologies confined to civilian end-uses. However, identifying specific technologies for control that will impact China’s military capabilities is challenging.

Generally, export control lists are made by identifying a weapons system (e.g., nuclear weapons) and then disaggregating the technology and components that go into the system or sub-system. However, the Export Control Reform Act of 2018 (ECRA) tasked BIS and others in the interagency to look at specific technologies and predict what might be applicable to a future weapons system or otherwise become of military or intelligence significance.²¹ Past U.S. attempts to identify critical technologies where the United States had a lead that might be preserved using export control regulations flopped. In 1980, the Department of Defense produced a Militarily Critical Technologies List (MCTL) and the Developing Science and Technologies List (DSTL). These lists, however, were neither incorporated into the Commerce Department’s control list, nor into the Department of State’s U.S. munitions list (USML).²² Likewise, the Biden administration has struggled at identifying a significant range of new items for control given the challenge of doing so – namely trying to predict how a technology might become militarily significant and preemptively regulating its trade or meeting the standards for

20 Ian F. Ferguson and Karen M. Sutter, “U.S. Export Control Reforms and China: Issues for Congress,” Congressional Research Service, January 15, 2021. <<https://fas.org/sgp/crs/natsec/IF11627.pdf>>.

21 For example, section 1758 of Public Law 232, John S. McCain National Defense Authorization Act for Fiscal Year 2019, <<https://www.congress.gov/bill/115th-congress/house-bill/5515/text>>. This sets forth the process of identifying emerging and foundational technologies and requires that BIS and the interagency establish a process to identify emerging and foundational technologies essential to national security which takes into account “(i)the development of emerging and foundational technologies in foreign countries; (ii)the effect export controls imposed pursuant to this section may have on the development of such technologies in the United States; and (iii)the effectiveness of export controls imposed pursuant to this section on limiting the proliferation of emerging and foundational technologies to foreign countries; ..”

22 For background on past and failed attempts to develop controls on technology, see Scott Jones, “Disrupting Export Controls: ‘Emerging and Foundational Technologies’ and Next Generation Controls,” *Strategic Trade Review*, Vol. 6, Issue 9 (Winter/Spring 2020).

inclusion in lists as set forth in ECRA. Again, U.S. and select allies' dominance of advanced semi-conductors is an important exception, but even here the impact of such controls may be limited unless key partners cooperate and coordinate in implementation and enforcement of controls. Some countries have already signaled resistance to these efforts to target China.

In 2018, the BIS issued an Advanced Notice of Proposed Rulemaking (ANPRM) on emerging technologies as authorized by the Export Control Reform Act.²³ BIS identified general categories of emerging technologies and sought industry and public input on specific emerging technologies that might be essential to national security. There were fourteen broad categories set forth for industry and public consideration: biotechnology; artificial intelligence (AI); position, navigation, and timing technology; microprocessor technology; advanced computing technology; data analytics; quantum information and sensing technology; robotics; certain logistics technology; additive manufacturing; brain-computer interfaces; hypersonics; advanced materials; and advanced surveillance technologies.

The responses received by BIS from industry and the public overwhelmingly opposed new controls and cautioned against any broad-based controls. Most commenters suggested that any new export controls should be narrowly focused on items that were central to national security. The Computer and Communications Industry Association, for example, proposed a definition of emerging technologies to items that among other factors “provide the United States with a specific and identifiable and qualitative military advantage ...are essential to the national security interests of the United States ... are not available in or being produced in foreign countries.”²⁴ Others, such as Kevin Wolf, former Assistant Secretary of Commerce for Export Administration, have likewise warned of broad controls harming the U.S. defense industrial base and driving research and development in emerging technology overseas, scenarios that would hurt U.S. national security.²⁵ Simply put, identification of any new items for control is challenging. And broad-based unilateral controls on emerging technology, if implemented, could undermine U.S. national security by driving production and research overseas.

To support the complex task of identifying emerging technologies, BIS turned to the *Emerging Technologies Technical Advisory Committee* (ETTAC), a group of industry and academic

23 Review of Controls for Certain Emerging Technologies,” *Federal Register*, November 19, 2018. <<https://www.federalregister.gov/documents/2018/11/19/2018-25221/review-of-controls-for-certain-emerging-technologies>>.

24 Comments of the Computer and Communications Industry Association (CCIA), Before the U.S. Department of Commerce Bureau of Industry and Security Washington, DC, <<https://www.ccianet.org/wp-content/uploads/2019/01/CCIA-Comments-in-BIS-2018-0024-Review-of-Controls-for-Certain-Emerging-Technologies.pdf>>.

25 See Testimony of the Honorable Kevin J. Wolf, Hearing on Modernizing Export Controls: Protecting Cutting Edge Technology and U.S. National Security, House Committee on Foreign Affairs (Mar 14, 2018) at 41-42, available at <<https://docs.house.gov/meetings/FA/FA00/20180314/107997/HHRG-115-FA00-Transcript20180314.pdf>>.

experts that act as an advisory body to BIS and other U.S. agencies.²⁶ Between 2020 and 2022, ETTAC held ten open meetings, all of which yielded very little by way of concrete proposals for new control list entries.²⁷ Instead, the committee and its members have wrestled with the reality that many technologies of interest are available abroad, are yet to emerge commercially, or remain notional.²⁸ ETTAC has not identified many specific technologies that have been crafted into proposed controls and then supported by the member countries of the Wassenaar Arrangement as envisioned.

The challenge of identifying new technologies is not just that it is inherently complex, but it is compounded by the work being left to part-time industry volunteers paired with government staff who do not have full insight into technological developments. ETTAC meetings involving private sector volunteers are held just three times a year with one day being an open session and a second day being a closed session. Most private sector representatives are unlikely to propose export restrictions that advance what they see as somewhat nebulous national security objectives. Moreover, there are few government experts who have a grasp on the cutting edge of emerging technologies, have thought about its potential military applications, and who also grasp how regulation might affect industry. Government experts working on control lists also have the additional puzzle of understanding how technologies are emerging in China and in other countries and how those developments might in turn impact any new proposed controls.

In 2020, BIS published a follow-on ANPRM for “foundational technologies.”²⁹ BIS sought public and industry comment to help identify foundational technologies essential to national security that might be subject to export controls. The ANPRM defined foundational technology as something that is “essential to innovation” and “essential to the national security of the United States.” Unlike the ANPRM for emerging technologies, the ANPRM for foundational technologies did not set forth specific categories of technologies but instead laid out examples of the types of end-uses and end-users that may trigger controls. Some of the examples include: semiconductor manufacturing equipment and associated software, tools, lasers, sensors that can be tied to military efforts in China, Russia or Venezuela; items designated as EAR 99 that might be utilized for developing weapons or for enabling foreign intelligence collection; and technologies that have been targeted for illicit procurement.

26 The ETTAC Charter, <<https://tac.bis.doc.gov/index.php/documents/pdfs/370-ettac-charter-1/fileETTAC>>. According to a presentation at ETTAC, meetings are held at least three times a year. Meetings typically last two days. Day one starts in an open session where all information talked about is public. However, later in the first day, a shift occurs where the meeting becomes closed and confidential information is discussed. The second day is a fully closed session. ETTAC replaces the Emerging Technology and Research Advisory Committee (ETRAC) which was established in 2014 to help identify technologies of interest to BIS. ETTAC was re-established under section 1758 of ECRA.

27 For a listing of announcements of these meetings of the ETTAC, see <<https://www.federalregister.gov/documents/search?conditions%5B%5B%5D%5B%5D=industry-and-security-bureau&conditions%5Bterm%5D=Emerging+Technology+Technical+Advisory+Committee&page=1>>.

28 For example, speaking at the November 9, 2020 meeting of ETTAC, Edward Samulski noted that next generation of polymers have not yet been invented and that one cannot speak of a world leader.

29 “Identification and Review of Controls for Certain Foundational Technologies,” *Federal Register*, August 27, 2020, <<https://www.federalregister.gov/documents/2020/08/27/2020-18910/identification-and-review-of-controls-for-certain-foundational-technologies>>.

Like the ANPRM for emerging technologies, this ANPRM yielded very little by way of industry or public assistance in identifying new items for controls.³⁰ Instead, industry responses often mirrored the responses to the ANPRM for emerging technology and urged caution. Respondents encouraged BIS to consider the potential unintended consequences of new controls, such as driving research and development in key technologies overseas or other adverse impacts on U.S. industry.³¹ They also called for examining foreign availability before introducing new controls and suggested limiting any new controls to only those technologies that are mature and clearly linked to clear national security interests.³² Some also suggested an end-user/end-use approach rather than new control list additions.³³

These efforts to identify technologies for control did not fail entirely. The Biden Administration recognized that China is extremely dependent upon the United States and key allies for advanced AI semi-conductors which have important commercial as well as military applications. Recognizing its control over chokepoint semiconductor technologies, the Biden Administration unleashed new export control rules in October 2022 that impose licensing requirements for exports of high-end semiconductors and chip design software, and which limit China's access to advanced semi-conductor manufacturing equipment as well as the components that they would need to make that equipment indigenously.³⁴ According to one analysis, these new export control rules represent "...a new U.S. policy of actively strangling large segments of the Chinese technology industry – strangling with an intent to kill." Some though are questioning whether the benefits of these new controls will outweigh their costs, especially if others in the semi-conductor supply chain fail to cooperate or if enforcement of the new export controls are lax.³⁵

30 For comments of the public see, "Identification and Review of Controls for Certain Foundational Technologies: Correction, Posted by the Bureau of Industry and Security on October 9, 2020, Docket (BIS-2020-0029), <<https://www.regulations.gov/document/BIS-2020-0029-0005/comment>>.

31 See for example, ITI Response to the Advance Notice of Proposed Rulemaking for the Identification and Review of Control for Certain Foundational Technologies (DOC#2020-2243), December 1, 2020, <<https://www.regulations.gov/comment/BIS-2020-0029-0030>>. "ITI is concerned that overly broad controls on technology products will undermine and limit the ability of companies to participate in the global marketplace, which will in turn disrupt the virtuous cycle of private-sector R&D investments made possible by revenues from sales of U.S. products to a diverse customer base in overseas markets."

32 Several comments on the ANPRM touched on the need to limit the scope of any controls to items clearly linked to national security and not trade policy issues. See, for example, KLA Comment on FR Doc # 2020-22443, December 1, 2020, Document (BIS-2020-0029-0005), <<https://www.regulations.gov/comment/BIS-2020-0029-0022>>.

33 See comment of BSA, The Software Alliance, on FR Doc #2020-2243, December 1, 2020, <<https://www.regulations.gov/comment/BIS-2020-0029-0033>>.

34 See "Commerce Implements New Export Controls on Advanced Computing and Semiconductor Manufacturing Items to the People's Republic of China (PRC)," October 7, 2022, at <<https://www.bis.doc.gov/index.php/documents/about-bis/newsroom/press-releases/3158-2022-10-07-bis-press-release-advanced-computing-and-semiconductor-manufacturing-controls-final/file>>.

35 See, for example, William Alan Reinsch, "Export Control: Too Much or Too Little," CSIS, *Commentary*, October 17, 2022, <<https://www.csis.org/analysis/export-control-too-much-or-too-little>>. Some European officials too have suggested they may not follow the U.S. lead on controls. See "Dutch Minister Says US Can't Dictate Approach to China Exports," Bloomberg, November 18, 2022, <<https://www.bnnbloomberg.ca/dutch-minister-says-us-can-t-dictate-approach-to-china-exports-1.1848672>>.

The Challenge of Building Multilateral Consensus Regarding Controls Targeting China

U.S. attempts to build multilateral consensus and coordinated controls around emerging technologies face the same obstacles as noted above. Moreover, there is a challenge of the U.S. selling the China threat to some reluctant Asian and European Union (EU) partners. Many EU Member States, such as Germany, are opposed to outright isolation of China or a renewal of Cold War trade war policies. Former Foreign Minister of Germany Heiko Maas stated, “Decoupling is the wrong way to go.”³⁶ Despite concerns about China’s methods of technology acquisition and human rights issues, many countries of the EU are keen not to risk one of their central trade partners and are skeptical about the use of export controls to counter China and keen to maintain trade relations. In 2020, China replaced the United States as the EU’s largest trading partner, according to Eurostat, which valued trade between the EU and China at USD \$709 billion.³⁷

As some analysts have noted, the EU shares many U.S. concerns about China, including its pursuit of Western technology, growing military ambitions, and human rights record; and that the EU is willing to join defensive measures such as restrictions on Chinese investment to protect domestic industries. At the same time, “there is a healthy skepticism in European capitals about Washington’s use of offensive economic tools, such as export controls, to counter China.”³⁸ Some U.S. partners are worried too that China will counter trade controls with export restrictions of their own, as they have in the past using their dominant position in rare earth metals.³⁹ Other Asian countries do not want to be drawn into a new Cold War.

Some multilateral collaboration with traditional allies looks to be in the offing with the announcement of the U.S.-EU Trade and Technology Council.⁴⁰ This new forum aims to develop a partnership around trade in advanced technology in response to China’s ambitions and desire to be a tech superpower. Besides efforts to promote joint investments in digital technologies and to coordinate on technology standards, it will seek to take on the challenge of forging a common approach to export controls on emerging technology.⁴¹ In addition, the Biden Administration has worked to establish the Chip 4 Alliance comprising the USA, Japan, South Korea, and Taiwan to secure the global semiconductor supply chain, and to coordinate

36 Teddy Ng, “China-German relations: Engage Don’t Isolate, Foreign Ministers Urge European Union,” *South China Morning Post*, April 22, 2021

37 “China Overtakes US as EU’s Biggest Trading Partner,” February 17, 2021, *BBC News*, <<https://www.bbc.com/news/business-56093378>> .

38 Noah Barkin, “Export Controls and the US-China Tech War,” MERICS China Monitor, March 18, 2020, <<https://merics.org/en/report/export-controls-and-us-china-tech-war>>. It is worth noting that some in the policy community are content with small changes to the multilateral regime lists. However, this is not the kind of change that members of Congress sought with respect to China.

39 Author interview with official of South Korea, 21 October 2022.

40 Daniel Michaels, “U.S., EU Forge Closer Ties on Emerging Technologies to Counter Russia and China,” *Wall Street Journal*, June 17, 2021, <<https://www.wsj.com/articles/u-s-eu-forge-closer-ties-on-emerging-technologies-to-counter-russia-and-china-11623922201>>.

41 U.S.-EU Summit Statement, June 15, 2021, Statements and Releases, The White House, <<https://www.whitehouse.gov/briefing-room/statements-releases/2021/06/15/u-s-eu-summit-statement/>>.

export controls on the semiconductor supply chain. However, this effort has met reported snags as some U.S. partners are concerned about China's potential response including counter-measures.⁴² A new Export Controls and Human Rights Initiative was launched at the Summit for Democracy in 2021 with a goal to "help stem the tide of authoritarian government misuse of technology and promote a positive vision for technologies anchored by democratic values."⁴³ This initiative which was signed by Australia, Denmark, Norway and the United States appears aimed primarily at China and concerns over use of surveillance tools in connection with human rights abuses. Nonetheless, it does not appear that the initiative will likely result in major policy changes outside of a narrow circle of allied countries.

Existing multilateral export control regimes too, such as the Wassenaar Arrangement, are ill equipped to play a role in keeping advanced technologies from China, or to introduce significant new controls on emerging technologies. The regimes have consensus rules that inhibit reform and a single country which is a member of the regimes, including in the case of some regimes Russia, can block new controls on emerging technology that might be proposed for addition to international lists. Moreover, the multilateral regimes meet infrequently which limits their ability to respond in a timely manner to technological developments. Most modifications of control lists occur only after months or years of consideration and are unlikely to achieve anything along the lines hoped for by some in the policy community who seem intent on recreating a Cold War-style regime for China.⁴⁴ Creating consensus to establish a new regime of "techno democracies" that targets China will be difficult to forge for many of the reasons noted above. A more likely possibility is establishing a new multilateral regime to target Russia.

Realities of Global Technology Development

Despite interest within the U.S. Congress to restrict technology trade with China, the reality is that the United States is far from being a leader in all areas of emerging technology. In some cases, China is already out front. Developing a control regime to thwart a country that is already leading might be counterproductive and potentially undermines U.S. and allied security. For example, in areas where the United States and its allies lead such as in advanced semiconductors, overly restrictive export controls could speed technological self-sufficiency. As Peter Wennick, the CEO of ASML, a leading manufacturer of advanced semiconductor equipment has noted, "If you shut out the Chinese with export control measures, you'll force them to strive toward tech sovereignty, in their case real tech sovereignty ... In 15 years' time they'll be able to do it all by themselves — and their market [for European suppliers] will be

42 Arjun Gargeyas, "The Chip 4 Alliance Might Work on Paper, But Problems Will Persist," *The Diplomat*, August 25, 2022.

43 "Fact Sheet: Export Controls and Human Rights Initiative Launched at the Summit for Democracy," <<https://www.whitehouse.gov/briefing-room/statements-releases/2021/12/10/fact-sheet-export-controls-and-human-rights-initiative-launched-at-the-summit-for-democracy/>>.

44 For example, the Strategic Competition Act of 2021, S. 1169, 117th Congress, proposed that the United States recreate a COCOM like body to target China.

gone.”⁴⁵

Unlike during the Cold War era, globalization of trade and technology development are significant obstacles to U.S. efforts to introduce new controls on emerging technology and goods. Most of the emerging technology categories identified by the Department of Commerce as part of its efforts to create new rules are evolving globally and increasingly through international academic and industrial collaborations that benefit many groups and countries.⁴⁶ Moreover, U.S. R&D investment is being met by stiff competition from China, which is now a close second.⁴⁷ If the intent is to deny China access to emerging technology, policy-makers may find that Chinese institutions have in some cases leap-frogged the United States or that foreign availability makes the introduction of such controls untenable.⁴⁸ An examination of research publications globally shows that China is a leader in generating new research in many key STEM fields which are homes to advances in emerging technologies.⁴⁹

To the extent that sub-categories (e.g., computer vision and hypersonics) or specific technologies are widely available or being innovated in many jurisdictions, controls will be of limited utility in achieving national security objectives. Likewise, some countries that are innovating in areas of emerging technology are not party to the multilateral export control regimes, and therefore unlikely to introduce controls on these items.

Artificial Intelligence and Controls

As an example of the complexity U.S. policy-makers face in introducing new trade controls, consider the case of Artificial Intelligence (AI). AI’s applied potential is as enormous as the

45 Lauren Cerulus, “Chipmaker CEO Says Washington’s Anti-tech Blockade is a Bad Idea,” *Politico*, April 23, 2022, at <<https://www.politico.eu/article/europe-tech-sovereignty-china-peter-wennink-asml/>>.

46 See, for example, McKinsey and Company, “Innovative Collaboration Techniques Improve Productivity Across Global Teams,” Summer 2018, <<https://www.mckinsey.com/industries/high-tech/how-we-help-clients/impact-stories/innovative-collaboration-techniques-improve-productivity-across-global-teams>>; and Takeshi Kuwahara, Hitoshi Irino, and Ken-Ichi Suzuki, “Global Collaboration Initiatives Revolutionizing Research and Development of Network Technologies,” *NTT Technical Review*, June 2018, <<https://www.ntt-review.jp/archive/ntttechnical.php?contents=ntr201806fa7.html>>.

47 See, for example, National Science Foundation, “Science and Engineering Indicators, 2018”, <<https://www.nsf.gov/statistics/2018/nsb20181/>>. According to report conclusions (chapter 4), “The United States remains the world’s largest R&D performer. Nonetheless, investments in R&D by other countries—particularly those in Asia—continue to increase, further eroding the longstanding U.S. lead. China (\$408.8 billion of R&D in 2015) has now moved well ahead of Japan (\$170.0 billion) as the second largest R&D-performing nation.”

48 See section 1758(a)(2)(B) of the Export Control Reform Act (ECRA) which requires agencies working to identify new technologies for control to consider “the development of emerging and foundational technologies in foreign countries.”

49 Autumn Toney and Melissa Flagg, “Comparing the United States’ and China’s Leading Roles in the Landscape of Science,” CSET Data Brief, Center for Security and Emerging Technology, June 2021.

challenge of controlling it.⁵⁰ U.S. based institutions are central and critical players in the promotion, evolution, and development of AI technologies.⁵¹ However, U.S. institutions are certainly not alone. China is also at the forefront of research and development in AI (specifically computer vision).⁵² As a subject of national industrial policy, Canada, China, Denmark, the EU Commission, Finland, France, India, Italy, Japan, Mexico, Singapore, South Korea, Sweden, Taiwan, the UAE, and the UK have all released strategies to promote the use and development of AI.⁵³

There is also a significant volume of cutting-edge AI research that is international in scope. Any new broad-based technology controls on AI risks chilling international research partnerships that are helping U.S. institutions that are at the forefront in developing these technologies.⁵⁴ Many of the leading U.S. universities rely heavily on foreign nationals, including Chinese graduate students, and collaboration with foreign institutions for ground-breaking research. As a recent study warned, broad-based export controls on AI could threaten U.S. leadership in AI by restricting who can work on AI technologies in the United States, or what U.S. researchers could share with foreign colleagues working domestically or abroad. If AI researchers from abroad are not welcome in the United States, they might seek partnerships in other countries in ways that jeopardize U.S. innovation. New export controls on AI then would run the risk of blocking the very international exchange that help keep U.S. institutions in front.⁵⁵

U.S. leadership in technologies like AI have benefitted from a culture of openness. Although undoubtedly, universities and an open research environment have also benefitted China and foreign states, the costs of expansive export controls on AI software and related algorithms could hurt U.S. industry. If U.S. industry is put at a competitive disadvantage via new controls, it

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- 50 See, for example, Darrell M. West and John R. Allen, “How Artificial Intelligence is Transforming the World,” The Brookings Institution, April 24, 2018, <<https://www.brookings.edu/research/how-artificial-intelligence-is-transforming-the-world/>>; and Tom Simonte, “AI Could Revolutionize War as Much as Nukes,” *Wired*, July 19, 2017, <<https://www.wired.com/story/ai-could-revolutionize-war-as-much-as-nukes/>>.
- 51 Andrea Viski, Scott Jones, Lindsay Rand, Tucker Boyce, and Jonas Siegel, “Artificial Intelligence and Strategic Trade Controls,” Strategic Trade Research Institute and Center for International and Security Studies at Maryland, June 2020.
- 52 See, Dr. Kai-Fu Lee, *AI Superpowers: China, Silicon Valley, and the New World Order* (New York: Houghton Mifflin Harcourt, 2018).
- 53 See, Tim Dutton, “An Overview of AI Strategies,” June 2018 <<https://medium.com/politics-ai/an-overview-of-national-ai-strategies-2a70ec6edfd>>. See also, the OECD Artificial Intelligence Policy Observatory, <<https://oecd.ai/>>.
- 54 Cade Metz, “Curbs on A.I. Exports? Silicon Valley Fears Losing Its Edge: The Commerce Department is Considering National Security Restrictions on Artificial Intelligence. Some Worry they Could Stunt the Industry in the U.S.,” *The New York Times*, January 1, 2019. As quoted in the article, “The number of cases where exports can be sufficiently controlled are very, very, very small, and the chance of making an error is quite large,” said Jack Clark, head of policy at OpenAI, an artificial intelligence lab in San Francisco. “If this goes wrong, it could do real damage to the A.I. community.” See also, Runhua Zhao, “Intel to Put Partnership Model at Core of its China AI plan,” *Technode*, November 15, 2018, at <<https://technode.com/2018/11/15/intel-to-put-partnership-model-at-core-of-its-china-ai-plan/>>.
- 55 Carrick Flynn, “Export Controls for Artificial Intelligence,” Center for Security and Emerging Technology, CSET Issue Brief, February 2020.

might harm R&D investment – in the same way that U.S. leadership in the satellite industry was undermined in the 1990s by reactionary export controls.⁵⁶ As one study suggests, “compliance with export controls is likely to disproportionately harm small businesses and start-ups, whose innovation has been central to U.S. industry’s success.”⁵⁷ Any harm to investment in R&D by industry would come at a time when China has put investment in the AI sector at the top of its national priorities.⁵⁸

One indicator of the “globalization” of work on AI is found in a review of scientific literature.⁵⁹ Recent research has highlighted, in particular, the extent to which China and the United States are leaders in key areas of science and technology.⁶⁰ From 2013 to 2017, China was the country with the largest number of publications in the Web of Science (WOS) category “Computer Science: Artificial Intelligence” with 59,573 publications, accounting for 25.02% of the total number of global publications, followed by the USA (32,527, 13.66%).⁶¹ Export controls are unlikely to slow research and the progress made in AI by Chinese institutions.

The Entity List Gone Wild

In parallel with efforts to regulate emerging and foundational technologies, the Trump and Biden administrations have expanded the use of the BIS’s Entity List (EL) to blacklist Chinese companies in response to a range of actions “contrary to the U.S. national security and foreign

56 See Kurtis J. Zinger, “An Overreaction that Destroyed an Industry: The Past, Present and Future of U.S. Satellite Export Controls,” October 26, 2014, <http://lawreview.colorado.edu/wp-content/uploads/2015/07/13.-86.1-Zinger_Final.pdf>.

57 Carrick Flynn, “Export Controls for Artificial Intelligence,” Center for Security and Emerging Technology, CSET Issue Brief, February 2020, pp. 4-5.

58 Ibid, p. 5.

59 As an emerging technology, AI is a deeply global venture in all of its intellectual and commercial endeavors. As noted in a recent global AI report published by Stanford University, “We can assert that AI is global. 83 percent of 2017 AI papers on Scopus originate outside the U.S. 28 percent of these papers originate in Europe — the largest percentage of any region. University course enrollment in artificial intelligence (AI) and machine learning (ML) is increasing all over the world. And there is progress beyond just the United States, China, and Europe. South Korea and Japan were the 2nd and 3rd largest producers of AI patents in 2014, after the U.S. Additionally, South Africa hosted the second Deep Learning Indaba conference, one of the world’s largest machine learning teaching events, which drew over 500 participants from 20+ African countries.” Yoav Shoham, Raymond Perrault, Erik Brynjolfsson, Jack Clark, James Manyika, Juan Carlos Nieves, Terah Lyons, John Etchemendy, Barbara Grosz, and Zoe Bauer, “The AI Index 2018 Annual Report”, AI Index Steering Committee, Human-Centered AI Initiative, Stanford University, Stanford, CA, December 2018, p. 5, <<http://cdn.aiindex.org/2018/AI%20Index%202018%20Annual%20Report.pdf>>.

60 Autumn Toney and Melissa Flagg, “Comparing the United States’ and China’s Leading Roles in the Landscape of Science,” Center for Security Emerging Technologies, CSET Data Brief, June 2021, <<https://CSET-Comparing-the-United-States-and-Chinas-Leading-Roles-in-the-Landscape-of-Science-1.pdf>>.

61 In terms of international collaboration, the countries/regions with the largest number of international collaborated publications are the U.S. (13,075) and China (12,227). The United Kingdom and Australia have the most active international collaborations, with the percentage of international collaborated publications both exceeding 50%. *Artificial Intelligence Index: 2018 Annual Report*, p. 13, <<http://cdn.aiindex.org/2018/AI%20Index%202018%20Annual%20Report.pdf>>.

policy interests.”⁶² This broadening of the Entity List has further moved export controls away from a tool of WMD nonproliferation to a tool of economic and technological containment. The Entity List originally was launched in 1997 by the Commerce Department to identify foreign entities engaged in WMD proliferation activities.⁶³ There was recognition that this would be important to prevent U.S. companies from supplying items that might not be found on the Commerce Control List (CCL), but that could nonetheless be directly or indirectly relevant to a WMD program or actor. Companies in Israel, Russia, India, China, and Pakistan were designated for engaging in WMD-related activities or related diversion.

In recent years, however, Entity List designations have exploded as part of an effort to use it for a wider range of national security, foreign policy, and, arguably, trade policy issues. In 2008, BIS created new rules that expanded the scope of reasons for adding parties to the Entity List to include “activities that are contrary to the national security or foreign policy interests of the United States.”⁶⁴ With this new rule, BIS added 79 new parties to the list for alleged links to Improvised Explosive Device (IED) supply chains.⁶⁵ Still, the focus was more narrowly on traditional national security concerns like support to terrorists or their state sponsors.

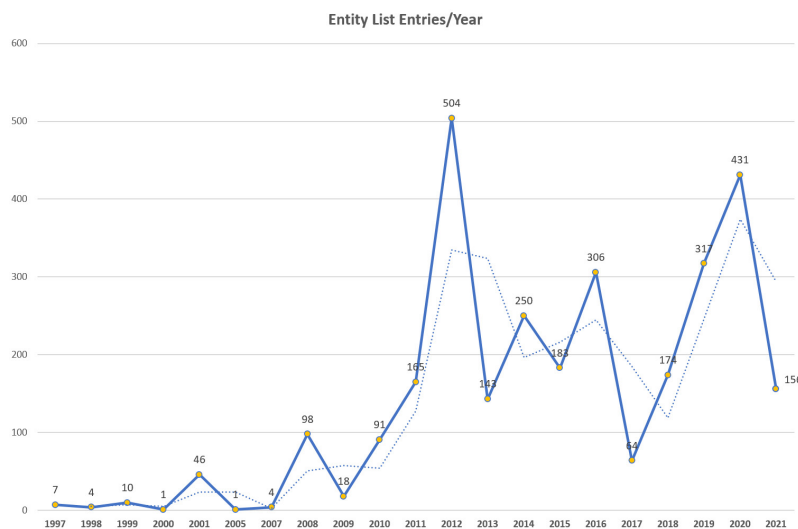


Figure 1. Entity List Entries/Year

62 Bureau of Industry and Security, U.S. Department of Commerce, Entity List, <<https://www.bis.doc.gov/index.php/policy-guidance/lists-of-parties-of-concern/entity-list>> .

63 Ibid.

64 Bureau of Industry and Security, Final Rule, “Authorization to Impose License Requirements for Exports or Reexports to Entities Acting Contrary to the National Security or Foreign Policy Interests of the United States,” *Federal Register* 73, No. 163 (August 21, 2008): 49311, <<https://www.govinfo.gov/content/pkg/FR-2008-08-21/pdf/E8-19102.pdf>>.

65 Bureau of Industry and Security, *15 CFR Parts 736 and 744*, “Addition of Certain Persons to the Entity List; Removal of General Order From the Export Administration Regulations (EAR)” *Federal Register*, Vol. 73, No. 184, September 22, 2008, <<https://www.govinfo.gov/content/pkg/FR-2008-09-22/pdf/E8-22088.pdf>>.

While the Obama administration used the EL to address limited activity outside of proliferation activity (e.g., Russian entities tied to the annexation of Crimea), the Trump and Biden administrations have used the Entity List as a convenient tool for countering Chinese actors for a range of alleged “malign activities.” The Entity List garnered considerable attention with the designation of the Chinese Information Communication Technology (ICT) firm ZTE – and then President Trump’s decision to remove the company from the Entity List as an apparent tactic to win favor with President Xi Jinping during trade talks. Later, Huawei and 68 of its affiliates were named to the Entity List, thereby signaling the use of the Entity List as a broader tool of a geopolitical fight and trade war.⁶⁶ The Entity List has since been used to target other Chinese technology companies, including ones with alleged ties to Uyghur oppression.

The use of the Entity List as a tool to address a growing range of Chinese and foreign behaviors poses potential problems. First, the Entity List is a unilateral element of U.S. export controls and not recognized by allied and foreign countries rendering it less useful than multilateral export controls. Second, while U.S. allies and partners supported U.S. efforts to target WMD proliferators, state sponsors of terror, and terrorists seeking dangerous items, these U.S. allies and partners are less keen to back end-user export controls as a tool to compete economically with China – meaning their unilateral application will have less impact. Third, the Entity List may disadvantage U.S. suppliers when the Entity List targets major Chinese companies with extensive supply chains. Unilateral lists, like the Entity List, deny or limit the ability of U.S. firms to conduct business with listed parties. The extent to which they affect foreign companies using U.S. origin technology (through the complex foreign direct product rules of the U.S.) could invite efforts to design EAR-free supply chains which ultimately harm U.S. companies.

The overuse of the Entity List as a dumpster for targeting foreign entities for a broad range of “malign” activities can ultimately blunt its impact. There is a profound difference between a company contributing to a nuclear weapons program in Iran, selling IED components, or supporting Russia’s military end-users and one that has allegedly engaged in activities deemed counter to U.S. foreign policy interests, such as developing tools that could be used for monitoring dissidents. Equally problematic is that companies that are designated have little hope of getting off the Entity List. Although U.S. regulations provide an opportunity for companies to appeal their listing to the interagency End User Review Committee (ERC), very few companies succeed in getting delisted.⁶⁷ As a result, there may not be an incentive to change behavior in an effort to move off the list.

Rethinking Export Controls on Emerging Technology and China

The United States has a litany of concerns regarding Chinese entities and China’s behavior both domestically and internationally, including abuses of human rights, the PLA’s actions and

66 See Jeremy Ney, “United States Entity List: Limits on American Exports,” Belfer Center Paper, February 2021, <<https://www.belfercenter.org/publication/united-states-entity-list-limits-american-exports>>.

67 The Biden Administration might consider a channel for listed companies to enter into a dialogue with the interagency in order to discuss ways in which problem behaviors can be addressed (e.g., with compliance or transparency measures). Being added to the Entity List requires only a majority vote, but removal requires unanimity. This highlights the greater ease of companies being listed, as opposed to de-listed.

military modernization, and charges that Chinese entities engage in anti-competitive economic and industrial policies that produce an unfair advantage. Unfortunately, some in the U.S. policy community want to deploy export control as a “must use” tool when it is often the wrong tool to address Chinese actions and policies. Moreover, spending valuable resources to develop new controls on emerging technology threatens to weaken the U.S. government’s ability to focus allies and other partner nations’ attention on enhancing export controls to achieve common nonproliferation objectives and other international security challenges – most urgently Russia’s aggression in Ukraine. Even the United States with its extensive export control bureaucracy is struggling to meet the many demands now placed upon it with a lack of new resources.

The United States should be careful not to allow export controls to become a primary tool to address trade and economic concerns emanating from China, like IP theft. ECRA notes that export controls should only be used to restrict export of items that make a “significant contribution to the military potential” of another country and to further significantly the foreign policy of the United States or fulfill its international obligations. Export controls on WMD-related (and advanced military) materials clearly meet such criteria. Export controls that limit Russia’s ability to wage an unlawful war meets this objective. Using export controls for economic or technological competition with China, however, may fail to meet these criteria and may not win multilateral support – thereby undermining their utility.

To meet the technological challenge from China, the United States must invest more heavily in making its markets and talent pool stronger. New legislation, such as the CHIPS Act, does include greater investment in research and development and support to the private sector to innovate.⁶⁸ Several congressional bills also seek to promote collaborations among democratic states in the development of emerging technologies. These investments in making the U.S. and its partners more competitive are much more likely to be effective than efforts to weaken China using instruments like export controls.

If the United States moves ahead and adopts further unilateral controls and targets more Chinese institutions with the Entity List or other sanctions list designations, China may respond in kind. China has already laid the foundation for countering both U.S. export controls and sanctions in its June 2021 Anti-Foreign Sanctions Law, and a new Export Control Law passed in 2020, which calls for regulatory reciprocity. China’s Ministry of Commerce (MOFCOM) also unveiled its Unreliable Entity List (UEL) in 2019, shortly after the Trump administration issued Executive Orders against WeChat and TikTok.⁶⁹ MOFCOM’s Unreliable Entity List (UEL) targets foreign companies that restrict transactions with Chinese firms, organizations, or individuals to comply with foreign sanctions and blacklists. Although China has a legal framework in place to counter U.S. trade controls, China has so far not moved aggressively to implement measures targeting U.S. companies. The hope is that cooler heads prevail so as not to escalate the conflict to a point that makes technological competition less likely and military confrontation a real possibility.

In conclusion, the United States should avoid unilateral controls on China that simultaneously fail

68 Grep IP, “Industrial Policy’ is Back: The West Dusts Off Old Idea to Counter China,” *The Wall Street Journal*, July 29, 2021, <<https://www.wsj.com/articles/subsidies-chips-china-state-aid-biden-11627565906>>.

69 “How China is Trying to Fight Back Against Sanctions,” *Bloomberg News*, June 29, 2021.

to advance national security while undermining U.S. economic competitiveness. Technological competition with China should be centered on promoting U.S. innovation and research, and a more realistic expectation of what defensive measures such as technology controls can achieve. Export controls, limits on foreign direct investment, and immigration constraints can achieve only a limited set of policy objectives and must be weighed carefully against the costs. Overly restrictive export controls and unilateral export controls have costs that some in the policy community appear not to recognize. In the case of export controls, the focus should be returned to preventing the most dangerous goods and technology (WMD-related) from finding their way into the hands of the most dangerous groups (rogue states and terrorist organizations) and hostile states, such as Russia, not as a primary tool of trade policy and economic competition.

