



China's Brute Force Economics: Waking Up from the Dream of a Level Playing Field

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Liza Tobin argues that the time has come for the United States and its allies to abandon the notion that competing on a level playing field with China's state-led economy is possible and confront the reality of what she calls the country's "brute force economics." China's tactics are not merely an assortment of cutthroat moves made by individual actors. Rather, they are features of Beijing's long-term strategy and are backed up by the full force of the country's party-state system, creating a challenge that Washington cannot afford to ignore.

In 2017, China's chief justice, Zhou Qiang, told legal officials in Beijing to resist "erroneous" ideas from the West like "constitutional democracy," "separation of powers," and "independence of the judiciary." His statements shocked some Western observers who had watched in cautious optimism as Zhou, a well-educated jurist with a reputation as a reformer, spearheaded efforts to make China's courts more professional.¹ Behind Zhou's words was a hard truth: Reforms could only go so far before they collided with the reality that, in the People's Republic of China, the judiciary is subordinate to the Chinese Communist Party.

This dynamic matters beyond China's borders. Cooperative trading relations require a common set of rules or expectations that ensure that economic competition occurs on a level playing field. Beijing's rejection of the rule of law as a fundamental operating principle means that the normative commercial structures upon which modern trade depends are at the mercy of a powerful and ideologically motivated political party. The Chinese Communist Party's ruthless pursuit of techno-economic dominance in a range of strategic sectors has distorted activities that are usually thought of as positive sum — trade and technology cooperation — into zero-sum games.

The time has come for the United States and its allies to abandon the notion that competing on a level playing field with China's state-led economy is possible and confront the reality of what I am calling the country's *brute force economics*. I use this term as an analytic frame to summarize the aggressive, evolving, and often opaque web of policies and tactics that Beijing employs to give

its national champions — corporations acting to advance government policy — an advantage and seize a dominant global market share in strategic sectors. The litany of specific practices is long: market access restrictions in strategic sectors, massive subsidies that fuel domestic overcapacity and enable Chinese firms to wipe out foreign competition, requirements for foreign firms to transfer technology in order to access the Chinese market, economic coercion, intellectual property theft, cyber- and human-enabled espionage, and forced labor. China's brute force economics playbook puts competing firms out of business and destroys entire industries in rival nations. Once international competitors to Chinese national champions are either acquired or eliminated, trade partners have no choice but to rely on Chinese firms for critical technology products or inputs.

Foreign firms are sometimes complicit in Beijing's economic distortions, owing to profit motives, ignorance, or fear of retribution if they speak out. Crucially, China's tactics are not merely an assortment of cutthroat moves made by individual actors. Rather, they are features of Beijing's long-term strategy, as I will argue below. As such, they are backed up by the full force of the country's party-state system, creating a challenge that Washington cannot afford to ignore.

Huawei is a prominent example of Beijing's no-holds-barred approach to boosting its national champions. State financial support worth an estimated \$75 billion, market access restrictions to limit foreign competition in China's domestic market, and decades of intellectual property theft and racketeering enabled Huawei to undercut rivals to become the world's leading telecom

1 Michael Forsythe, "China's Chief Justice Rejects an Independent Judiciary, and Reformers Wincede," *New York Times*, Jan. 18, 2017, <https://www.nytimes.com/2017/01/18/world/asia/china-chief-justice-courts-zhou-qiang.html>.

equipment vendor and suppress innovation in the global telecom equipment industry.² After Washington fought back with export controls and a diplomatic campaign to sound the alarm regarding digital dependence on an autocratic rival,³ threats of retaliation by China's "wolf warrior" diplomats and state media against countries considering

network equipment, and even energetic materials that power the U.S. military's missiles and rockets.⁵ Policymakers have started to take action. The Trump administration compiled extensive evidence of China's market-distorting practices,⁶ threatened tariffs to bring Chinese negotiators to the table, and, once negotiations

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banning Huawei from their fifth-generation (5G) networks erased any uncertainty about whether resisting the company's advances meant entering Beijing's crosshairs.⁴

China's brute force economics has set off alarm bells in Washington and allied capitals. Of particular concern is the country's emergence as a dominant player in a growing number of strategic industries such as steel, aluminum, solar panels, wind turbines, electric vehicle batteries, high-speed rail, commercial drones, telecoms

failed to produce meaningful structural reforms, imposed tariffs. So far, the Biden administration has kept these tariffs in place.⁷ Both administrations increased coordination with allies and part-

ners, with Trump's team launching a trilateral trade ministerial with the European Union and Japan that was renewed by the Biden administration.⁸ President Joe Biden also set up new bilateral consultations on trade and technology issues with Brussels and has taken other actions, such as issuing executive orders to improve supply chain resilience and bolster the criteria for screening inbound investments for national security risks.⁹

Despite this growing momentum, Washington

2 Chuin-Wei Yap, "State Support Helped Fuel Huawei's Global Rise," *Wall Street Journal*, Dec. 25, 2019, <https://www.wsj.com/articles/state-support-helped-fuel-huaweis-global-rise-11577280736>; Jonathan Pelson, "This Is War," *The American Mind*, June 21, 2022, <https://americanmind.org/features/this-is-war/>; Steven Overly, "U.S. Charges Huawei with Decades-long Theft of U.S. Trade Secrets," *Politico*, Feb. 13, 2020, <https://www.politico.com/news/2020/02/13/us-charges-huawei-with-racketeering-and-theft-114912>; and Robert D. Atkinson, "How China's Mercantilist Policies Have Undermined Global Innovation in the Telecom Equipment Industry," Information Technology and Innovation Foundation, June 22, 2020, <https://itif.org/publications/2020/06/22/how-chinas-mercantilist-policies-have-undermined-global-innovation-telecom/>.

3 Cassell Bryan-Low et al., "Hobbling Huawei: Inside the U.S. War on China's Tech Giant," *Reuters*, May 21, 2019, <https://www.reuters.com/investigates/special-report/huawei-usa-campaign/>.

4 "Wolf warrior" refers to an aggressive brand of coercive diplomacy that has emerged among China's diplomats in recent years. See "Understanding China's Wolf Warrior Diplomacy," Interview with Peter Martin, National Bureau of Asian Research, Oct. 22, 2021, <https://www.nbr.org/publication/understanding-chinese-wolf-warrior-diplomacy/>. For examples of these threats, see Tony Czuczka and Steven Arons, "China Threatens Retaliation Should Germany Ban Huawei 5G," *Bloomberg*, Dec. 14, 2019, <https://www.bloomberg.com/news/articles/2019-12-14/china-threatens-germany-with-retaliation-if-huawei-5g-is-banned>; and Stu Woo, "China Threatens Retaliation Against Ericsson if Sweden Doesn't Drop Huawei 5G Ban," *Wall Street Journal*, May 11, 2019, <https://www.wsj.com/articles/china-threatens-retaliation-against-ericsson-if-sweden-doesnt-drop-huawei-5g-ban-11620740192>.

5 On U.S. concerns regarding solar panels, wind turbines, electric vehicles (a.k.a., new energy vehicles) and batteries, telecoms, high-speed rail, and steel, see "Findings of the Investigation Into China's Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation Under Section 301 of the Trade Act of 1974," Office of the United States Trade Representative, March 22, 2018, <https://ustr.gov/sites/default/files/Section%20301%20FINAL.PDF>. On energetics, see Nadia Schadlow et al., *Rocket's Red Glare: Modernizing America's Energetics Enterprise*, Hudson Institute, October 2022, <http://media.hudson.org.s3.amazonaws.com/Rockets+Red+Glare+-+Modernizing+America%E2%80%99s+Energetics+Enterprise.pdf>. On aluminum and several other sectors, see "2021 Report to Congress on China's WTO Compliance," United States Trade Representative, February 2022, <https://ustr.gov/sites/default/files/enforcement/WTO/2021%20USTR%20Report%20to%20Congress%20on%20China%27s%20WTO%20Compliance.pdf>. On commercial drones, see "Is China at the Forefront of Drone Technology?" China Power, Center for Strategic and International Studies, accessed Nov. 28, 2022, <https://chinapower.csis.org/china-drones-unmanned-technology/>.

6 "Findings of the Investigation Into China's Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation Under Section 301 of the Trade Act of 1974," Office of the United States Trade Representative, March 22, 2018, <https://ustr.gov/sites/default/files/Section%20301%20FINAL.PDF>.

7 "Biden Administration to Maintain China Tariffs while Review Continues," *Reuters*, Sept. 2, 2022, <https://www.reuters.com/markets/us/biden-administration-maintain-china-tariffs-while-review-continues-2022-09-02/>.

8 "U.S., EU, Japan Trade Ministers Agree to Renew Three-Way Partnership – Statement," *Reuters*, Nov. 17, 2021, <https://www.reuters.com/world/asia-pacific/us-eu-japan-trade-ministers-agree-renew-three-way-partnership-statement-2021-11-17/>.

9 "U.S.-EU Statement of the Trade and Technology Council," White House, May 16, 2022, <https://www.whitehouse.gov/wp-content/uploads/2022/05/TTC-US-text-Final-May-14.pdf>; "Executive Order on America's Supply Chains," White House, Feb. 24, 2021, <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/02/24/executive-order-on-americas-supply-chains/>; and "FACT SHEET: President Biden Signs Executive Order to Ensure Robust Reviews of Evolving National Security Risks by the Committee on Foreign Investment in the United States," White House, Sept. 15, 2022, <https://www.whitehouse.gov/briefing-room/statements-releases/2022/09/15/fact-sheet-president-biden-signs-executive-order-to-ensure-robust-reviews-of-evolving-national-security-risks-by-the-committee-on-foreign-investment-in-the-united-states/>.

and its allies are still struggling to fully conceptualize the challenge of brute force economics, much less mount a sufficiently robust counteroffensive. As a director responsible for coordinating China policy at the National Security Council during the Trump and Biden administrations, I experienced this firsthand. One conceptual hurdle resulted from the difficulty of distinguishing between “fair” and “foul” in explaining China’s achievements. After all, Beijing’s success in capturing global market share has partially resulted from “textbook” economic factors: the unleashing of entrepreneurialism and trade after decades of near-autarky, China’s robust investments in manufacturing infrastructure, and the country’s natural advantages of size and scale.

But these factors do not tell the whole story. For my colleagues and me in the executive branch, textbook economic concepts like “market failure,” “macroeconomic imbalances,” and “trade distortions” were thin soup. Scholars have rightly described China’s policies as “mercantilist” or “neo-mercantilist.”¹⁰ But even these terms are insufficient to diagnose Beijing’s predatory mix of mercantilism, aggression, and criminality — operating at a scale that only China can muster.

Key Features of Brute Force Economics

The “brute” in brute force economics refers to the *force*, *ruthlessness*, and *scale* that characterize China’s economic strategy and make it an unprecedented challenge for Washington and its allies. While policy discourse, especially among U.S. economic officials, tends to focus on particular facets of the problem, such as market access restrictions, technology theft, or unfair subsidies,

the reality is that these components overlap and are integrally linked in a comprehensive strategy that is more powerful and pernicious than the sum of its parts.

Force

As an economically powerful and technologically advanced autocracy, the Chinese Communist Party can drive the full force of the party-state-military-intelligence system and the country’s massive national resources to serve its objectives. A foreign firm competing for global market share with a Chinese national champion is not competing with a typical commercial company but rather with what China scholar Jude Blanchette calls “CCP Inc.,”¹¹ as the Huawei example above demonstrates. Such blurred lines offer both disadvantages and advantages for individual Chinese firms. On the negative side of the ledger, when push comes to shove, even ostensibly private firms have no choice but to throw their weight behind the party’s goals. Chinese law compels all individuals and companies in China to assist in national security and intelligence work, if required.¹² On the other hand, national champions enjoy tangible advantages over their foreign competitors: China’s spending on industrial policy — estimated at \$248 billion in a single year — far exceeds comparable spending by the United States and other advanced economies.¹³ China’s subsidy and export credit practices violate its World Trade Organization (WTO) commitments,¹⁴ but the WTO and its members have been powerless to stop them. National champions bidding for overseas business also have benefits that are harder to quantify, like state security agents stealing trade secrets and wolf warrior diplomats wielding incentives,

10 For example, Robert D. Atkinson describes Beijing’s policies as “innovation mercantilism.” See “China’s ‘Innovation Mercantilism’ Reduces the Rate of Global Innovation,” Information Technology and Innovation Foundation, Oct. 7, 2021, <https://itif.org/publications/2021/10/07/chinas-innovation-mercantilism-reduces-rate-global-innovation/>. I wish to thank an anonymous reviewer for pointing out a useful definition of neomercantilism: “strategic protectionist policies and other forms of government economic activism to promote state wealth and power,” in Eric Helleiner, *The Neomercantilists: A Global Intellectual History* (Ithaca, NY: Cornell University Press, 2021). As my anonymous reviewer rightly notes, China’s “brute force” policies are not without historical precedent but are “a variant of neomercantilism, made more potent by the sheer size of the Chinese economy and the ability of the Chinese state to direct the activities of economic actors.”

11 This term comes from the Center for Strategic and International Studies project by this name. See “CCP Inc.,” Center for Strategic and International Studies, accessed Nov. 28, 2022, <https://www.csis.org/programs/freeman-chair-china-studies/ccp-inc>.

12 Nazak Nikakhtar, “U.S. Businesses Must Navigate Significant Risk of Chinese Government Access to Their Data,” *Wiley*, March 2021, <https://www.wiley.com/newsletter-Mar-2021-PIF-US-Businesses-Must-Navigate-Significant-Risk-of-Chinese-Government-Access-to-Their-Data>; Murray Scot Tanner, “Beijing’s New National Intelligence Law: From Defense to Offense,” *Lawfare*, July 20, 2017, <https://www.lawfareblog.com/beijings-new-national-intelligence-law-defense-offense>; and William Evanina, “Keynote Remarks as Prepared for Delivery,” International Legal Technology Association LegalSEC Summit 2019, June 4, 2019, page 2, https://www.dni.gov/files/NCSC/documents/news/20190606-NCSC-Remarks-ILTA-Summit_2019.pdf.

13 Gerard DiPippo, Ilaria Mazzocco, and Scott Kennedy, *Red Ink: Estimating Chinese Industrial Policy Spending in Comparative Perspective*, Center for Strategic and International Studies, May 2022, https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/220523_DiPippo_Red_Ink.pdf?LH8ILLKwz4o.bjrwNS7csuX_C04FyEre.

14 Stephen Ezell, “False Promises II: The Continuing Gap Between China’s WTO Commitments and Its Practices,” Information Technology and Innovation Foundation, July 26, 2021, <https://itif.org/publications/2021/07/26/false-promises-ii-continuing-gap-between-chinas-wto-commitments-and-its/>.



inducements, and threats on their behalf.¹⁵

Ruthlessness

Beijing's rhetorical commitment to "common development," and "win-win cooperation"¹⁶ frames its economic relations with other nations in positive sum terms, but its behavior belies a zero-sum approach that shows little regard for the costs of its behavior for other nations. These are not mere marginal costs of doing business that can be easily written off. A Boston-based cyber security firm estimated in May that a Chinese state-backed cyber hacker stole *trillions* of dollars' worth of sensitive and proprietary data on everything from diabetes drugs to missiles from approximately 30 multinational corporations in North America, Europe, and Asia.¹⁷ An independent commission estimated that China's economic espionage and intellectual property theft cost the U.S. economy up to \$600 billion annually, discouraging capital investments required for innovation and undermining U.S. firms' overseas competitiveness.¹⁸ Even when justice is served, it often comes too late to protect American firms.

In one example, Chinese manufacturer Sinovel stole U.S. firm AMSC's proprietary wind turbine technology instead of paying the agreed-upon price. In 2018, a U.S. federal jury found Sinovel guilty on all charges including conspiracy and trade secret theft starting in 2011. But by the time the verdict was rendered, Sinovel's crimes had already caused AMSC to lose half its workforce (almost 700 jobs), \$1 billion in shareholder equity, and \$550 million in trade secrets, according to court docu-

ments.¹⁹ Meanwhile, China's wind turbine industry prospered, with exports growing from \$2.9 billion in 2017 to \$7.2 billion in 2021.²⁰

Scale

With a globally integrated, state-directed economy second only in size to that of the United States, China can practice brute force economics on a scale that no other nation can. The United States has often absorbed the unfair practices of its trading partners. However, China's sheer size makes it an outlier, both in terms of direct harm and the opportunity costs it imposes by restricting access to 1.4 billion consumers for products and services that the United States excels in producing, like data services and social media. Sectors that Beijing partially or completely blocks to foreign competition include telecoms, fisheries, media, smartphones, agricultural machinery, cargo ships, electric vehicles, digital payments, solar panels, and — ironically — wind turbines, among others.²¹ It would be difficult to estimate the total cost to U.S. firms from lost revenues owing to China's market access restrictions, but according to some estimates these restrictions cost individual U.S. firms billions of dollars.²² The reverse is not true: The Chinese app TikTok is projected to earn nearly \$6 billion in U.S. ad revenues in 2022,²³ while Meta and other U.S. tech platforms are blocked from China's market. Market access restrictions mean that China's accessible market — which is what matters for foreign businesses — is smaller than what is suggested by China's massive economy and population.

15 On state security agents, see Christopher Wray, "The Threat Posed by the Chinese Government and the Chinese Communist Party to the Economic and National Security of the United States," remarks as delivered, Hudson Institute, 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>. On Beijing's economic coercion by wolf warrior diplomats and others, see Bonnie S. Glaser, "Time for Collective Pushback Against China's Economic Coercion," Center for Strategic and International Studies, Jan. 13, 2021, <https://www.csis.org/analysis/time-collective-pushback-against-chinas-economic-coercion>.

16 These phrases are found frequently in China's propaganda. See, for instance, Lin Songtian, "Common Prosperity through Win-Win Cooperation," *China Daily*, July 7, 2022, <http://global.chinadaily.com.cn/a/202207/05/WS62c373fea310fd2b29e6a4cc.html>.

17 Nicole Sganga, "Chinese Hackers Took Trillions in Intellectual Property from About 30 Multinational Companies," *CBS News*, May 4, 2022, <https://www.cbsnews.com/news/chinese-hackers-took-trillions-in-intellectual-property-from-about-30-multinational-companies/>.

18 The IP Commission, "Written Comments on Behalf of the Commission on the Theft of American Intellectual Property to the United States Trade Representative," National Bureau of Asian Research, May 11, 2018, https://www.nbr.org/wp-content/uploads/pdfs/publications/ustr_written_comments_301_tariffs-may2018.pdf.

19 "Court Imposes Maximum Fine on Sinovel Wind Group for Theft of Trade Secrets," U.S. Department of Justice, July 6, 2018, <https://www.justice.gov/opa/pr/court-imposes-maximum-fine-sinovel-wind-group-theft-trade-secrets>. Also see Nate Raymond, "China's Sinovel Convicted in U.S. of Trade-Secret Theft," *Reuters*, Jan. 24, 2018, <https://www.reuters.com/article/us-sinovel-wind-gro-usa-court-idUSKBN1FD2XL>.

20 Andrew David, "Chinese Wind Turbine Export Growth Continued in 2021," U.S. International Trade Commission, March 2022, https://www.usitc.gov/publications/332/executive_briefings/ebot_chinese_wind_turbine_export_growth_continued_in_2021.pdf.

21 Agatha Kratz and Janka Oertel, "Home Advantage: How China's Protected Market Threatens Europe's Economic Power," European Council on Foreign Relations, April 2021, <https://ecfr.eu/wp-content/uploads/Home-advantage-How-Chinas-protected-market-threatens-Europes-economic-power.pdf>.

22 Robert D. Atkinson, "A U.S. Grand Strategy for the Global Digital Economy," Information Technology and Innovation Foundation, Jan. 19, 2021, <https://itif.org/publications/2021/01/19/us-grand-strategy-global-digital-economy/>.

23 "TikTok's Ad Revenue to Surpass Twitter and Snapchat Combined in 2022 - report," *Reuters*, April 11, 2022, <https://www.reuters.com/technology/tiktoks-ad-revenue-surpass-twitter-snapchat-combined-2022-report-2022-04-11/>.

Brute Force Economics and the Party's Technology Strategy

Chinese leader Xi Jinping describes the world as experiencing “change on a scale unseen in a century” and an epochal power shift from west to east that offers China the opportunity to emerge as the world’s leading power.²⁴ Critically, the Chinese Communist Party believes that success will depend on its ability to seize the advantage in disruptive and emerging technologies. In 2017, the party set a goal for China to become a “global leader in innovation by 2035.”²⁵ This is not about technological achievement only for its own sake or for economic gain. As scholar Rush Doshi, who in 2021 joined the Biden administration as a National Security Council China director, explained in 2020, “China’s leaders have often seen technology and economic exchange through a political lens, particularly as a way to avoid dependency, strengthen China’s ‘comprehensive power,’ and build order.”²⁶ As Xi said in 2021, “Technological innovation has become one of the main fields of international strategic competition, and the contest in key sci-tech areas is fierce.”²⁷ At the 20th Party Congress in October 2022, where Xi secured a third five-year term as general secretary, he doubled down on these goals, emphasizing the need for China to achieve “self-reliance” in science and technology.²⁸

Brute force economics is an expression of the Chinese Communist Party’s character as a political system. Within its own ranks, the party insists

that its Marxist political system has been critical to China’s success thus far and will continue to be essential to achieving its objective of making China the world’s leading power.²⁹ Its system, according to Beijing, enables the country to carry out long-term planning and marshal large-scale resources to pursue state objectives in technological, military, economic, and other domains, sustaining a collective effort in a way that democracies often cannot.³⁰ For Beijing, China’s economic rise and technological achievements are evidence that its system and strategy are correct — and justification to pursue its strategy by all means necessary. In other words, the political ends justify the economic means. Brute force economics is embedded in China’s political institutions and is likely to survive even if Xi exits the scene and his successors try to soften the edges.

In its quest for comprehensive national power, Beijing has pursued what it calls “indigenous innovation” for more than a decade and a half.³¹ This strategy aims to boost China’s technological self-sufficiency by replacing imports of advanced technology with domestic production, to climb the global manufacturing value chain, and to capture greater international market share. Beijing’s Made in China 2025 plan, issued in 2015, gained notoriety in Washington owing to its explicit targets for market share across a wide range of critical technologies.³² (Recognizing the strategic and economic challenge for what it was, the Trump administration targeted these technology imports with its first tranche of tariffs.) These Chinese

24 Xi Jinping, *The Governance of China*, Volume IV (Beijing: Foreign Language Press, 2022), 224. The quote comes from a speech Xi delivered at the Chinese Academy of Sciences entitled “Strive for Greater Strength and Self-Reliance in Science and Technology” on May 28, 2021.

25 Xi Jinping, *The Governance of China*, Volume IV, 225. Xi first expressed this goal publicly in his report to the 19th Party Congress on Oct. 18, 2017. Xi Jinping, *The Governance of China*, Volume II (Beijing: Foreign Language Press, 2020), 29.

26 Rush Doshi, “The United States, China, and the Contest for the Fourth Industrial Revolution,” testimony before the U.S. Senate Committee on Commerce, Science, and Transportation, July 31, 2020, <https://www.brookings.edu/testimonies/the-united-states-china-and-the-contest-for-the-fourth-industrial-revolution/>.

27 Xi Jinping, *The Governance of China*, Volume IV, 224.

28 “Full Text of the Report to the 20th National Congress of the Communist Party of China,” Ministry of Foreign Affairs of the People’s Republic of China, Oct. 25, 2022, https://www.fmprc.gov.cn/eng/zxxx_662805/202210/t20221025_10791908.html.

29 On Jan. 11, 2022, Xi Jinping said, “To stay at the forefront of the times, a nation must always be guided by the right theories and thoughts. How does the [Chinese Communist Party] succeed? Why does Chinese socialism work? Because Marxism works... Marxism points the way for advancing human society. It is a powerful theoretical weapon for us to understand the world and its underlying trends, seek the truth, and change the world.” Xi Jinping, *The Governance of China*, Volume IV, 35.

30 In a speech on May 30, 2016, entitled “Build China into a World Leader in Science and Technology,” Xi Jinping said, “Our greatest strength lies in our socialist system, which enables us to pool resources in a major mission. This is the key to our success. We have relied on this in making noticeable scientific breakthroughs in the past. And today we will still rely on this in achieving leapfrog scientific and technological innovations. We will develop a new mechanism under the socialist market economy to pool our resources in scientific initiatives.” Xi Jinping, *The Governance of China*, Volume II, 292–303. For more on the role of ideology in the Chinese Communist Party’s strategy, see Daniel Tobin, “How Xi Jinping’s ‘New Era’ Should Have Ended U.S. Debate on Beijing’s Ambitions,” Center for Strategic and International Studies, May 8, 2020, <https://www.csis.org/analysis/how-xi-jinpings-new-era-should-have-ended-us-debate-beijings-ambitions>.

31 Bradford Waldie, “Lexicon: Indigenous Innovation or Independent Innovation (自主创新, Zìzhǔ Chuàngxīn),” *DigiChina*, March 7, 2022, <https://digichina.stanford.edu/work/lexicon-indigenous-innovation-or-independent-innovation-zizhu-chuangxin/>.

32 “Unofficial USCBC Chart of Localization Targets by Sector Set in the MIIT Made in China 2025 Key Technology Roadmap,” U.S.-China Business Council, accessed Nov. 28, 2022, <https://www.uschina.org/sites/default/files/2-2-16%20Sector%20and%20Localization%20Targets%20for%20Made%20in%20China%202025.pdf>.

policies have much earlier roots, however. A major policy document issued in 2006 — the Medium- and Long-Term Plan for Science and Technology Development — set guidelines for the next 15 years and prioritized advances in integrated circuits, industrial biotechnology, information technology, including broadband mobile telecoms, and many other sectors. It called for China to “leapfrog in priority fields” and “lead the future.”³³ These themes continued in Beijing’s 2010 decision to support seven “strategic emerging industries.”³⁴ More recently, China’s 14th five-year plan for 2021–2025 intensified the drive for self-sufficiency with a policy dubbed “dual circulation”³⁵ — essentially a one-way decoupling strategy that seeks to increase the world’s dependence on China while reducing China’s dependence on the world for critical technologies.³⁶ China’s push for self-sufficiency and decoupling is not a reaction to recent tensions between the United States and China but has been underway for many years.³⁷

Has Beijing’s approach been effective? Setting ambitious goals does not guarantee success, and massive outlays on industrial policies have led to waste. Measuring China’s technological progress is challenging since rigorous assessments are constrained in an opaque and autocratic system and the long-term effects of wasteful industrial policies take time to become clear. Caution and humility are warranted, but given China’s success in achieving market dominance in commercial

drones, lithium-ion batteries, 5G wireless technology, and other sectors,³⁸ the United States and its allies should not be complacent.

The implications for the United States and its democratic allies go beyond the techno-economic. All of Beijing’s plans are dual-use, aiming to maximize the efficient use of finite national resources to drive economic and military modernization simultaneously. Beijing’s national military-civil fusion strategy that emerged in the 2010s seeks to ensure that breakthroughs in civilian research and commercial sectors advance both military and economic objectives.³⁹ Business leaders, technologists, and scholars involved in cutting-edge sectors should be on notice that their industries are in Beijing’s sights.

Creating dependence in critical sectors provides Beijing with strategic leverage. As the Ukraine crisis has painfully highlighted for European countries, depending on an adversary for critical inputs like energy can suddenly prove dangerous and costly during a crisis. China, with an economy 10 times the size of Russia’s and an outsized role in global supply chains,⁴⁰ has a greater capacity than Russia to weaponize its economic clout and a growing track record of doing so.⁴¹ America’s reliance on China for products and materials that are critical to the defense industrial base — such as rare earth elements required for military hardware like the F-35 and night vision devices — would leave the country vulnerable in a bilateral

33 “The National Medium- and Long-Term Program for Science and Technology Development (2006–2020),” The State Council, the People’s Republic of China, 2006, https://www.itu.int/en/ITU-D/Cybersecurity/Documents/National_Strategies_Repository/China_2006.pdf.

34 *China’s Strategic Emerging Industries: Policy, Implementation, Challenges, & Recommendations*, U.S.-China Business Council, March 2013, <https://www.uschina.org/sites/default/files/sei-report.pdf>.

35 “Outline of the People’s Republic of China 14th Five-Year Plan for National Economic and Social Development and Long-Range Objectives for 2035,” Center for Security and Emerging Technology, March 12, 2021, Trans. Etcetera Language Group, Inc., https://cset.georgetown.edu/wp-content/uploads/t0284_14th_Five_Year_Plan_EN.pdf.

36 Matt Pottinger, “Testimony Before the United States-China Economic and Security Review Commission,” April 15, 2021, https://www.uscc.gov/sites/default/files/2021-04/Matt_Pottinger_Testimony.pdf.

37 See, e.g., Aaron L. Friedberg, *Getting China Wrong*, (Cambridge, UK: Polity Press, 2022), 171–72; and Rush Doshi, *The Long Game: China’s Grand Strategy to Displace American Order*, (New York: Oxford University Press, 2021), 134–56. For official Chinese Communist Party sources on self-reliance, see “Outline of the People’s Republic of China 14th Five Year Plan”; and Xi Jinping, *Governance of China*, Volume IV, 224–33 for a speech that Xi delivered in May 2021 entitled, “Strive for Greater Strength and Self-Reliance in Science and Technology.”

38 For a comparative assessment of American and Chinese leadership in key technologies, see “Harnessing the New Geometry of Innovation,” Special Competitive Studies Project, November 2022, <https://www.scspp.ai/wp-content/uploads/2022/11/Platforms-Panel-IPR.pdf>, 14–19. For more on commercial drones, see “Is China at the Forefront of Drone Technology?” Center for Strategic and International Studies, accessed Nov. 29, 2022, <https://chinapower.csis.org/china-drones-unmanned-technology/>. For more on lithium-ion batteries, see “Share of the Global Lithium-Ion Battery Manufacturing Capacity in 2021 with a Forecast for 2025, by Country,” Statista, accessed Sept. 24, 2022, <https://www.statista.com/statistics/1249871/share-of-the-global-lithium-ion-battery-manufacturing-capacity-by-country/#:~:text=China%20dominated%20the%20world%27s%20lithium,that%20entered%20the%20global%20market>. As of 2021, Huawei had finalized more 5G contracts than any other company. David Sacks, “China’s Huawei Is Winning the 5G Race. Here’s What the United States Should Do to Respond,” Council on Foreign Relations, March 29, 2021, <https://www.cfr.org/blog/china-huawei-5g>.

39 “Military-Civil Fusion Strategy and the People’s Republic of China,” Department of State, accessed Nov. 29, 2022, <https://www.state.gov/wp-content/uploads/2020/05/What-is-MCF-One-Page.pdf>.

40 Gerard DiPippo, “Deterrence First: Applying Lessons from Sanctions on Russia to China,” Center for Strategic and International Studies, May 3, 2022, <https://www.csis.org/analysis/deterrence-first-applying-lessons-sanctions-russia-china>.

41 Aaron L. Friedberg, “The United States Needs to Reshape Global Supply Chains,” *Foreign Policy*, May 8, 2020, <https://foreignpolicy.com/2020/05/08/united-states-reshape-global-supply-chains-china-reglobalization/>.

dispute or crisis.⁴² In fact, China has threatened to cut off America's rare earth supply several times, including as recently as 2021.⁴³

Innovation Economics in a Zero-Sum World

Evidence is mounting that Beijing's use of brute force economics is undermining innovation in other countries, putting their long-term prosperity at risk. Robert D. Atkinson has shown that, by shrinking markets and reducing profits that innovators need to invest, China's mercantilist practices have slowed the progress of innovation in the United States and other developed nations.⁴⁴ Innovation is the single most important long-term driver of economic growth for advanced economies like the United States.⁴⁵ Thus, allowing China's brute force economics to continue unchecked may hinder the U.S. economy's capacity to generate prosperity for Americans.

The distortionary effects of China's brute force economics can be understood through the lens of what economists call *absolute* versus *comparative* advantage. The theory of comparative advantage posits that trade allows countries to specialize in items they can produce at a lower opportunity cost compared to other nations. When each country specializes in its areas of comparative advantage, trade produces overall welfare gains in the form of increased total output and product variety.⁴⁶ The theory suggests that, with a few exceptions, trade barriers should be reduced or removed. At the turn of the millennium, the logic of comparative advantage

animated U.S. policymakers seeking to grant China permanent normal trading status and help it gain membership in the WTO. They believed this would unleash unprecedented new economic opportunities for Americans as China removed trade barriers to state-backed industries. In 2000, President Bill Clinton predicted, "For the first time, our companies will be able to sell and distribute products in China made by workers here in America without being forced to relocate manufacturing to China, sell through the Chinese government, or transfer valuable technology We'll be able to export products without exporting jobs."⁴⁷

The opposite occurred. One study estimates that between 2001, when China joined the WTO, and 2018, the growing trade deficit with China cost the United States 3.7 million manufacturing jobs. The computer and electronic parts industry was hit particularly hard: Three congressional districts in the industry's epicenter, Silicon Valley, lost between 12 and 20 percent of total jobs.⁴⁸ As the jobs depart, the skills are lost as well. After decades of moving manufacturing jobs offshore, it is little wonder that many U.S. companies are facing large shortages in workers with technical skills.⁴⁹ Scholars have also documented that when China targeted and subsidized a sector in its five-year plans, it was correlated with fewer new firms and lower output, employment, and earnings in corresponding sectors in the United States.⁵⁰

America's loss has been China's gain. As Jonathan Pelson explains, "this model of wealth creation [comparative advantage] only applies when you're dealing with trading counterparts, where the relationships are long-term and the tone is

42 "Report Says U.S. Military Dangerously Dependent on Foreign Suppliers," Alliance for American Manufacturing, 2020, <https://www.american-manufacturing.org/press-release/report-says-u-s-military-dangerously-dependent-on-foreign-suppliers-2/>; and Valerie Bailey Grasso, "Rare Earth Elements in National Defense: Background, Oversight Issues, and Options for Congress," Congressional Research Service, Dec. 23, 2013, <https://sgp.fas.org/crs/natsec/R41744.pdf>.

43 Sun Yu and Demetri Sevastopulo, "China Targets Rare Earth Export Curbs to Hobble US Defence Industry," *Financial Times*, Feb. 16, 2021, <https://www.ft.com/content/d3ed83f4-19bc-4d16-b510-415749c032c1>; and Keith Johnson and Elias Groll, "China Raises Threat of Rare-Earths Cutoff to U.S.," *Foreign Policy*, May 21, 2019, <https://foreignpolicy.com/2019/05/21/china-raises-threat-of-rare-earth-mineral-cutoff-to-us/>.

44 Robert D. Atkinson, "Innovation Drag: China's Economic Impact on Developed Nations," Information Technology and Innovation Foundation, Jan. 6, 2020, <https://itif.org/publications/2020/01/06/innovation-drag-chinas-economic-impact-developed-nations/>.

45 Gregory Tassej, "Beyond the Business Cycle: The Need for a Technology-based Growth Strategy," *Science and Public Policy* 40, no. 3 (June 2013): 293–315, <https://doi.org/10.1093/scipol/scs106>.

46 "Comparative Advantage," Britannica, last updated Oct. 7, 2022, <https://www.britannica.com/topic/comparative-advantage>.

47 "Full Text of Clinton's Speech on China Trade Bill," remarks delivered at the Paul H. Nitze School of Advanced International Studies of the Johns Hopkins University, March 9, 2000, accessed at the Institute for Agriculture & Trade Policy, https://www.iatp.org/sites/default/files/Full_Text_of_Clinton_s_Speech_on_China_Trade_Bi.htm.

48 Robert E. Scott and Zane Mokhiber, "Growing China Trade Deficit Cost 3.7 Million American Jobs Between 2001 and 2018," Economic Policy Institute, Jan. 30, 2020, <https://files.epi.org/pdf/181374.pdf>. For more on how trade with China led to U.S. job losses, see David Autor, David Dorn, and Gordon H. Hanson, "The China Shock and Its Enduring Effects," Stanford Center on China's Economy and Institutions, Oct. 1, 2022, <https://sccie.fsi.stanford.edu/china-briefs/china-shock-enduring-effects>.

49 Michael Collins, "Manufacturing's Back Is to the Wall on the Skilled Labor Shortage," *Industry Week*, June 9, 2022, <https://www.industry-week.com/talent/education-training/article/21243760/manufacturings-back-is-to-the-wall-on-skilled-labor>.

50 Xiao Cen, Vyacheslav Fos, and Wei Jiang, "A Race to Lead: How China's Government Interventions Shape U.S.-China Industrial Competition," Stanford Center on China's Economy and Institutions, 2020, updated Aug. 1, 2022, https://fsi-iver.s3.us-west-1.amazonaws.com/s3fs-public/race_to_lead_8.1.22_0.pdf.

primarily cooperative.”⁵¹ The theory of comparative advantage is not wrong. It is simply that Beijing is operating on different principles, pursuing absolute advantage for China rather than comparative advantage and greater total welfare for the world. Laws of economics suggest that China’s excesses must eventually catch up with it, but it is impossible to predict when this will happen and how it will affect Beijing’s approach to the outside world. For now, because of China’s large size, its brute force economics is changing the international landscape, making competition on a level playing field impossible.

Brute Force Economics in Practice

A look at a few case studies, in addition to the telecoms and wind turbine examples above, illuminates how China’s brute force economics works in practice to increase domestic production, knock out foreign competition, and seize international market share.

Solar Panels

According to Rick Switzer and David Feith, “Solar technology was invented and first commercialized in the U.S., only to be targeted later by China’s state planners.”⁵² Solar technology has been a priority for Beijing since the publication of the Medium- and Long-Term Plan for Science and Technology Development in 2006.⁵³ Access to foreign technology, generous state support, and preferential policies for domestic firms combined to produce striking results: Since 2005, China’s share of global production of solar photovoltaic cells rose from seven to more than 80 percent, more than double its domestic demand.⁵⁴ To achieve this, China dramatically scaled up production, lowered prices, and dumped

solar panels on the international market. American and European solar companies shed jobs, bled market share, and eventually had no choice but to shut down.⁵⁵

The harm went beyond lost industries and jobs. David M. Hart has shown that China’s below-market prices reduced incentives for foreign innovators to invest in alternative pathways to innovation in solar power, likely resulting in less diversity in solar technology today.⁵⁶ To make matters worse, much of the world’s polysilicon, a key component used to produce solar panels, comes from Xinjiang in northwest China, where the government is conducting a systematic campaign of mass repression and genocide targeting ethnic and religious minorities that includes the use of forced labor. In 2021, the United States banned imports from a Chinese producer of silica-based products used in solar panels that is suspected of using forced labor, and later that year it passed a law prohibiting imports from Xinjiang unless the importer could provide evidence that the goods were not produced with forced labor.⁵⁷ China’s dominance in the solar supply chain has forced upon the rest of the world a Solomonic choice between the rapid expansion of solar power, on the one hand, and avoiding complicity in Beijing’s systematic human rights abuses, on the other.

Shipbuilding

Shipbuilding, also a priority in China’s 2006 plan for science and technology development, has followed a similar playbook. Blanchette assessed that state support between 2010 and 2018 worth approximately \$132 billion, along with barriers to foreign competition, forced technology transfer, and state-sponsored hacking and commercial espionage, facilitated China’s growing dominance in the maritime supply chain. Other countries have

51 Pelson, “This Is War.”

52 Rick Switzer and David Feith, “China Hit Some Bumps on Its Road to Semiconductor Dominance,” *Wall Street Journal*, Sept. 20, 2022, <https://www.wsj.com/articles/china-hit-some-bumps-on-its-road-to-semiconductor-dominance-solar-shipbuilding-five-year-plans-subsidies-chips-act-smic-bankruptcy-11663703332>.

53 The State Council, the People’s Republic of China, “The National Medium- and Long-term Program for Science and Technology Development.”

54 See David M. Hart, “The Impact of China’s Production Surge on Innovation in the Global Solar Photovoltaics Industry,” Information Technology and Innovation Foundation, Oct. 5, 2020, <https://itif.org/publications/2020/10/05/impact-chinas-production-surge-innovation-global-solar-photovoltaics/>; and “Solar PV Global Supply Chains,” International Energy Agency, July 2022, <https://www.iea.org/reports/solar-pv-global-supply-chains/executive-summary>.

55 Keith Bradsher, “When Solar Panels Became Job Killers,” *New York Times*, April 8, 2017, <https://www.nytimes.com/2017/04/08/business/china-trade-solar-panels.html>.

56 Hart, “The Impact of China’s Production Surge.”

57 Thomas Kaplan, Chris Buckley and Brad Plumer, “U.S. Bans Imports of Some Chinese Solar Materials Tied to Forced Labor,” *New York Times*, June 24, 2021, <https://www.nytimes.com/2021/06/24/business/economy/china-forced-labor-solar.html>. On Dec. 23, 2021, Biden signed into law the Uyghur Forced Labor Prevention Act, which prohibits the import of products made in Xinjiang unless “clear and convincing evidence” is provided to U.S. customs authorities that the goods were not made with forced labor. “Uyghur Forced Labor Prevention Act,” U.S. Customs and Border Protection, accessed Nov. 29, 2022, <https://www.cbp.gov/trade/forced-labor/UFLPA>.



provided support to their domestic shipbuilding industries, but, as Blanchette notes, “the scale of China’s support is unmatched.” As a result, China went from roughly 10 percent of global shipbuilding market share in 2002 to around 50 percent in 2021.⁵⁸ The stakes for the United States are strategic as well as commercial. As Blanchette notes, in a military contingency the United States could face maritime logistics challenges given the shrinking size of its merchant marine fleet.⁵⁹

Border Security Technology

Chinese state-owned enterprise Nuctech, founded by former Chinese General Secretary Hu Jintao’s son, has enjoyed generous state support, a

protected home market, and ties to China’s military and the highest levels of Chinese Communist Party power to become the world’s leading company by revenue for cargo and vehicle scanners used at ports and airports around the world. By underbidding foreign rivals by 30 to 50 percent, Nuctech is seizing a growing global market share. In the European Union, Nuctech has won contracts in 26 out of 27 member states, including in sensitive locations such as along NATO’s borders with Russia and in Europe’s largest ports.⁶⁰ Only a 2014 ban on Nuctech equipment in U.S. airports spared the United States from a similar fate.⁶¹ The ban was proven prescient in 2020, when Nuctech was added to the Department of Commerce’s Entity List, which imposes export licensing requirements,

58 Panle Jia Barwick, Myrto Kalouptsidi, and Nahim Bin Zahur, “China’s Industrial Policy: An Empirical Evaluation,” National Bureau of Economic Research, July 2019, revised September 2019, https://www.nber.org/system/files/working_papers/w26075/w26075.pdf (see second chart on p. 45 for China’s market share expansion through 2014.) For market share in 2021, see Katherine Si, “China Claims World Leading Shipbuilding Nation in 2021,” *Seatrade Maritime News*, Jan. 18, 2022, <https://www.seatrade-maritime.com/shipyards/china-claims-world-leading-shipbuilding-nation-2021> (“China’s shipbuilding output, newly received orders and orders on hand accounted for 47.2%, 53.8% and 47.6% respectively of the global shipbuilding market share.”).

59 Jude Blanchette, “Hidden Harbors: China’s State-backed Shipping Industry,” Center for Strategic and International Studies, July 8, 2020, <https://www.csis.org/analysis/hidden-harbors-chinas-state-backed-shipping-industry>.

60 Erika Kinetz, “Security Scanners Across Europe Tied to China Govt, Military,” *Associated Press*, Jan. 20, 2022, <https://apnews.com/article/technology-business-china-russia-europe-120b7dedacd8d545bf4521a1948bc31e>.

61 Rohan Abraham, “US Accuses Chinese Screening Tech Firm Nuctech of Passing Passenger Info to Beijing,” *Economic Times*, July 3, 2020, <https://economictimes.indiatimes.com/magazines/panache/us-accuses-chinese-screening-tech-firm-nuctech-of-passing-passenger-info-to-beijing/articleshow/76769001.cms>.

because Nuctech's equipment performed below par when it came to detecting nuclear and other radioactive materials.⁶² The growing presence of Nuctech equipment at border locations overseas undermines efforts by the United States and its foreign partners to stop the proliferation of materials that could be used in weapons of mass destruction.

Electric Vehicle Batteries

Beijing's ambitions to build a world-class automobile sector date back to its 863 Program, a high-tech development plan launched in 1986.⁶³ In the medium- to long-term plan released two decades later, this ambition was refined to focus on energy-efficient and new energy automobiles and was reemphasized in Made in China 2025. In 2016, the Chinese government announced that a "third industrial revolution" focusing on digitization and "new energy" would allow China to take the lead in automobiles. Lavish government subsidies, a captive home market, and requirements that foreign automakers transfer critical technology to a local firm in order to sell cars in China have allowed national champion CATL to capture one-third of the global electric-car battery market.⁶⁴

Looking ahead, Beijing's brute force economics will not stop at solar panels, shipbuilding, border security equipment, and batteries. China's 14th five-year plan makes clear that industries at the cutting edge of the American economy, like artificial intelligence, semiconductors, biotechnology, aerospace, blockchain, and cloud computing are all in China's line of fire.⁶⁵ In the semiconductor industry, for instance, Beijing's playbook is on full

display. It is leveraging massive amounts of state support, targeted intellectual property theft to aid national champions, knowledge transfer from technical experts trained in the United States and allied countries, and preferential treatment for domestic firms to tilt the playing field in its favor.⁶⁶ The sheer complexity of the semiconductor industry has held back Beijing's progress in some areas, but over time it is mastering more complex processes. Projections suggest that China could become the world leader in chip manufacturing by volume within 10 years.⁶⁷

Selective Disentanglement: Countering Beijing's Brute Force Economics

Traditional channels for addressing China's brute force economics have been tried repeatedly and found insufficient. Over the last two decades, Washington has made numerous good-faith efforts to deal directly with Beijing through bilateral dialogues, trying to persuade China's leaders to operate on a level playing field and comply with its WTO commitments.⁶⁸ The United States has also frequently worked through multilateral channels, bringing 27 cases against China in the WTO, many of them in conjunction with other member states. But despite winning every case that was decided, China's pattern of behavior continued and in many cases worsened.⁶⁹

Given the failure of years of engagement to persuade Beijing to change course, Washington should frame its approach differently than in the

62 "Addition of Entities to the Entity List, Revision of Entry on the Entity List, and Removal of Entities from the Entity List," Federal Register, Dec. 22, 2020, <https://www.federalregister.gov/documents/2020/12/22/2020-28031/addition-of-entities-to-the-entity-list-revision-of-entry-on-the-entity-list-and-removal-of-entities>.

63 John D. Graham, Keith B. Belton, and Suri Xia, "How China Beat the U.S. in Electric Vehicle Manufacturing," *Issues in Science and Technology* XXXVII, no. 2 (Winter 2021), <https://issues.org/china-us-electric-vehicles-batteries/>.

64 Keith Bradsher and Michael Forsythe, "Why a Chinese Company Dominates Electric Car Batteries," *New York Times*, Dec. 22, 2021, <https://www.nytimes.com/2021/12/22/business/china-catl-electric-car-batteries.html>; and D. Graham, Belton, and Xia, "How China Beat the U.S. in Electric Vehicle Manufacturing."

65 U.S. export controls have slowed Huawei's expansion in global markets for 5G network hardware, but these policies do not limit Huawei's expansion in other sectors. Huawei is expanding into markets such as cloud services currently dominated by U.S. firms like Amazon Web Services. Simon Sharwood, "Oracle and Huawei Clouds the Big Movers on Gartner's Conjured Quadrilateral," *The Register*, Nov. 1, 2022, https://www.theregister.com/2022/11/01/gartner_cloud_magic_quadrant_2022/.

66 "China's New Semiconductor Policies: Issues for Congress," Congressional Research Service, April 20, 2021, <https://crsreports.congress.gov/product/pdf/R/R46767>. For intellectual property theft, see Jordan Robertson and Michael Riley, "Engineer Who Fleed Charges of Stealing Chip Technology in US now Thrives in China," *Bloomberg*, June 5, 2022, <https://www.bloomberg.com/news/articles/2022-06-06/engineer-who-fled-us-charges-of-stealing-chip-technology-now-thrives-in-china>. For knowledge transfer, see Kensaku Ihara, "Taiwan Loses 3,000 Chip Engineers to 'Made in China 2025,'" *Nikkei Asia*, Dec. 3, 2019, <https://asia.nikkei.com/Business/China-tech/Taiwan-loses-3-000-chip-engineers-to-Made-in-China-2025>. For preferential policies, see Arjun Kharpal, "China Unveils Policies to Boost Chipmakers as Tensions with U.S. Rise. Analysts Say They May not Help," *CNBC*, Aug. 10, 2020, <https://www.cnbc.com/2020/08/11/china-policies-to-boost-chipmakers-as-tensions-with-us-rise.html>.

67 Antonio Varas et al., "Government Incentives and U.S. Competitiveness in Semiconductor Manufacturing," Semiconductor Industry Association, September 2020, 8, <https://www.semiconductors.org/wp-content/uploads/2020/09/Government-Incentives-and-US-Competitiveness-in-Semiconductor-Manufacturing-Sep-2020.pdf>.

68 United States Trade Representative, "2021 Report to Congress on China's WTO Compliance."

69 United States Trade Representative, "2021 Report to Congress on China's WTO Compliance."

past. It should adjust to the fact that, in China, it does not have a sincere, cooperative partner. The United States should focus primarily on shaping its own choices, then on shaping those of its allies and partners, and lastly (and with low expectations for success), on shaping Beijing's. As Secretary of State Antony Blinken acknowledged in a speech in May 2022, "We cannot rely on Beijing to change its trajectory." Instead, America will seek to "shape the strategic environment around Beijing."⁷⁰

Washington and its allies should pursue a strategy of selective disentanglement from China that would deny support to Beijing's techno-economic ambitions while strengthening ties with each other. Selective disentanglement should be thought of as a progressive shift, not an abrupt and total abandonment of economic and trade ties with China.⁷¹ It should focus on areas where economic and technological entanglement poses the greatest risks for national security and competitiveness, such as critical infrastructure and technology. Change will entail some pain and disruption for the United States and its allies, but it will also result in creative destruction that clears a path for new growth opportunities.

A strategy of selective disentanglement with China should combine offensive, defensive, and collective elements. It should have three prongs: doubling down on asymmetric American advantages, denying support to China's accumulation of techno-economic power, and moving away from overreliance on China and toward increased interdependence with friends.⁷²

Double Down on Asymmetric American Advantages

Prevailing against China's brute force economics requires the United States to get its own house in order, that is, to strengthen its domestic competitiveness. But this need not mean trying to "out-China China." America's economy and innovation ecosystem have numerous advantages that China

is hard pressed to match, including world-class universities and research institutions, the ability to attract talent from around the world, a highly productive and growing workforce, and global leadership in finance backed up by trusted institutions that foster conditions in which innovation thrives. The United States should double down on these systemic strengths and ensure that policies that support them are up to date for an age of emerging technology and strategic rivalry. Vital steps for strengthening America's innovation ecosystem include boosting support for research and development, maximizing the digital economy's potential, and investing in a tech-savvy workforce.

Research and Development

Increased spending on research and development can not only spur innovation but can also serve as a powerful mechanism to boost productivity growth and GDP over the long term.⁷³ The CHIPS and Science Act that Biden signed into law in August 2022 is a step in the right direction, providing a \$52 billion infusion to boost semiconductor production, including \$11 billion for research and development.⁷⁴ Policymakers should make additional investments in research and development in battleground technologies like smart manufacturing, biotechnology, next-generation networks, and computing technology. They should also incentivize public-private partnerships that harness the dynamism of America's private sector to pursue scientific and technological goals of strategic significance.⁷⁵

Digital Infrastructure

China used brute force economics to stake out Huawei's dominant position in global 5G network infrastructure. But the United States still has an opportunity to race ahead by capturing the economic promise of 5G to unlock America's potential as an advanced manufacturing powerhouse. The United States is already investing billions of

70 Antony J. Blinken, "The Administration's Approach to the People's Republic of China," Speech delivered at the George Washington University, Washington, D.C., May 26, 2022, <https://www.state.gov/the-administrations-approach-to-the-peoples-republic-of-china/>.

71 As Aaron Friedberg writes, there are "many possible equilibrium points between the status quo and complete, mutual economic closure." Friedberg, *Getting China Wrong*, 181–86.

72 For a proposed U.S. strategy to strengthen techno-industrial competitiveness and counter China's distortionary practices, see "Restoring the Sources of Techno-Economic Advantage," Special Competitive Studies Project, November 2022, <https://www.scsp.ai/wp-content/uploads/2022/11/Economy-Panel-IPR-FINAL-Version.pdf>.

73 Tasse, "Beyond the Business Cycle."

74 "Fact Sheet: CHIPS and Science Act Will Lower Costs, Create Jobs, Strengthen Supply Chains, and Counter China," White House, Aug. 9, 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/>.

75 For more on a proposed U.S. approach to competing in "battleground technologies," see "Mid-Decade Challenges to National Competitiveness," Special Competitive Studies Project, Sept. 12, 2022, <https://www.scsp.ai/reports/mid-decade-challenges-for-national-competitiveness/>, in particular chaps. 1 and 7. For more details, see Special Competitive Studies Project, "Harnessing the New Geometry of Innovation."



Beijing's target list is long, posing a prioritization challenge for Washington, but biotechnology, an area in which the United States currently sits at the technological frontier, stands out.

dollars deploying Huawei-free telecom network infrastructure across the country,⁷⁶ but it should also look ahead to the applications that will run on advanced public and private networks, like smart factories that could make it more appealing for firms to bring production back to American shores. The U.S. government should boost incentives for innovators to create and diffuse these applications.⁷⁷

Workforce

America's productive and still-growing workforce, and its ability to attract global talent, is one of its greatest strengths, particularly in contrast to China, where demographic decline is an economic drag.⁷⁸ In the United States, however, shortages in skilled workers in some technical fields are a limiting factor in the nation's ability to outcompete China. The United States should strengthen education and workforce training programs and speed up immigration processes to ensure it has a workforce that can compete and thrive in cutting-edge technology sectors.⁷⁹

Deny Support to China's Techno-Economic Ambitions

Getting its own house in order will not be sufficient. The United States should also target China's brute force tactics. To do so, America, working with allies and partners whenever possible, should stop supporting China's buildup of techno-economic power at the expense of its own security, values, and prosperity. The United States should not provide material support to China when doing so will 1) accelerate China's military modernization, 2) enable Beijing's techno-authoritarian abuses of human rights, or 3) weaken the long-term competitiveness of U.S. and allied high-tech industries.

There is already growing policy consensus on the first two criteria. When it comes to military modernization, for example, ensuring that China does not use U.S. technology and know-how to develop military technology like hypersonic weapons, deep-earth penetrating warheads, and quieter submarines — as it has done in the past⁸⁰ — is hardly a controversial policy objective among U.S. national security professionals, even though more concrete policies and robust implementation are urgently needed. On the human rights front, some U.S. firms stopped providing technology to China when it was revealed that it was being used for state surveillance and human rights abuses in Xinjiang.⁸¹ More robust export controls,⁸² as well as new laws, policies, due diligence standards, and ethical guidelines are needed, but at least the principles are gaining wider acceptance.

Much stronger consensus is needed on the third criterion — the need to stop supporting China's ability to out-compete the United States. National Security Adviser Jake Sullivan in a speech in September 2022 referred to this idea, stating that

we have to revisit the longstanding premise of maintaining 'relative' advantages over competitors in certain key technologies. We previously maintained a 'sliding scale' approach that said we need to stay only a couple generations ahead. This is not the strategic environment we are in today. ... We must maintain as large of a lead as possible.⁸³

Sullivan's words were backed up by an executive order published the same week strengthening the Committee on Foreign Investment in the United States. The order broadened the scope for investment review beyond traditional defense issues to include criteria such as protecting Americans'

76 "National Strategy Needed to Guide Federal Efforts to Reduce Digital Divide," U.S. Government Accountability Office, May 31, 2022, <https://www.gao.gov/products/gao-22-104611>.

77 For specific policy proposals on strengthening U.S. digital infrastructure, see Special Competitive Studies Project, "Restoring the Sources of Techno-Economic Advantage," 30–40.

78 Dexter Tiff Roberts, "Can China's Communist Party Defuse Its Demographic Time Bomb?" Atlantic Council, Dec. 21, 2022, <https://www.atlanticcouncil.org/blogs/new-atlanticist/can-chinas-communist-party-defuse-its-demographic-time-bomb/>.

79 For specific policy proposals strengthening the technical skills of the U.S. workforce, see Special Competitive Studies Project, "Restoring the Sources of Techno-Economic Advantage," 40–47.

80 "The Los Alamos Club: How the People's Republic of China Recruited Leading Scientists from Los Alamos National Laboratory to Advance Its Military Programs," Strider Technologies, 2022, <https://www.striderintel.com/wp-content/uploads/Strider-Los-Alamos-Report.pdf>.

81 Natasha Khan, "American Firm, Citing Ethics Code, Won't Sell Genetic Sequencers to Xinjiang," *Wall Street Journal*, Feb. 20, 2019, <https://www.wsj.com/articles/thermo-fisher-to-stop-sales-of-genetic-sequencers-to-chinas-xinjiang-region-11550694620>.

82 For more on export controls, see David Hanke, "Testimony Before the U.S.-China Economic and Security Review Commission," Hearing on U.S.-China Relations in 2021: Emerging Risks, Sept. 8, 2021, https://www.uscc.gov/sites/default/files/2021-08/David_Hanke_Testimony.pdf; and Special Competitive Studies Project, "Restoring the Sources of Techno-Economic Advantage," 57–63.

83 "Remarks by National Security Advisor Jake Sullivan at the Special Competitive Studies Project Global Emerging Technologies Summit," White House, Sept. 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/>.



sensitive data and enhancing U.S. supply chain resilience. Crucially, the executive order also directed the committee to consider whether a transaction affects U.S. “technological leadership and therefore national security” and listed microelectronics, artificial intelligence, biotechnology, and several other sectors as examples.⁸⁴ Several weeks later, in its strongest policy actions on China to date, the Biden administration announced new controls on the sales of advanced semiconductors and semiconductor manufacturing equipment to China and restrictions on U.S. persons providing support to the sector, among other measures that, if implemented robustly, will slow China’s progress in semiconductors, high-performance computing, and artificial intelligence.⁸⁵ Generating a greater understanding of these policy changes among executive branch departments and agencies, Congress, industry, the American public, and U.S. allies and partners is important in order to generate support for vigorous enforcement. It will also help build momentum for further policy action to prevent China from surpassing the United States in additional fields such as quantum computing and biotechnology.⁸⁶

Closer monitoring of, and enhanced restrictions on, China’s access to U.S. markets, technology, and expertise in cutting-edge technology sectors will be required. When it comes to the Committee on Foreign Investments in the United States, this means keeping the process up to date by regularly moni-

toring China’s strategic documents as they are issued, since they provide insight into what sectors Beijing is targeting.

Beijing’s target list is long, posing a prioritization challenge for Washington, but biotechnology, an area in which the United States currently sits at the technological frontier,⁸⁷ stands out. A strong uptick in Chinese merger and acquisition activity in the U.S. biotech sector in the last few years reveals an aggressive effort by China to acquire American intellectual property in a race to get ahead.⁸⁸ Furthermore, China is using foreign-acquired technology to conduct mass DNA collection in violation of Chinese law and international human rights norms.⁸⁹ In 2013, despite security concerns raised in a Committee on Foreign Investments in the United States investigation, Chinese genomics company BGI acquired California-based Complete Genomics, which had developed the fastest and most cost-effective gene mapping technology in the world.⁹⁰ BGI has subsequently risen to become the world’s largest genetic research organization. According to the Department of Defense, BGI contributes to China’s military-civil fusion strategy,⁹¹ and, in 2020, two of its subsidiaries were added to a U.S. export blacklist for collaborating with Beijing in committing human rights abuses against ethnic minorities in Xinjiang.⁹² Chinese acquisitions of U.S. biotech companies should be afforded an extra level of scrutiny, and in many cases restricted,⁹³ to ensure

84 “Executive Order on Ensuring Robust Consideration of Evolving National Security Risks by the Committee on Foreign Investment in the United States,” White House, Sept. 15, 2022, <https://www.whitehouse.gov/briefing-room/presidential-actions/2022/09/15/executive-order-on-ensuring-robust-consideration-of-evolving-national-security-risks-by-the-committee-on-foreign-investment-in-the-united-states/>.

85 “Commerce Implements New Export Controls on Advanced Computing and Semiconductor Manufacturing Items to the People’s Republic of China,” Bureau of Industry and Security, U.S. Department of Commerce, Oct. 7, 2022, <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>; and Ana Swanson, “Biden Administration Clamps Down on China’s Access to Chip Technology,” *New York Times*, Oct. 7, 2022, <https://www.nytimes.com/2022/10/07/business/economy/biden-chip-technology.html>.

86 For specific proposals on how the United States should build on the new export controls, see Special Competitive Studies Project, “Restoring the Sources of Techno-Economic Advantage,” 56–62.

87 See, for example, Robert D. Atkinson, “China’s Biopharmaceutical Strategy: Challenge or Complement to U.S. Industry Competitiveness?” Information Technology and Innovation Foundation, Aug. 12, 2019, <https://itif.org/publications/2019/08/12/chinas-biopharmaceutical-strategy-challenge-or-complement-us-industry/>.

88 Erik Britton, “Beware of People Bearing Gifts,” Fathom Consulting, Aug. 31, 2022, <https://www.fathom-consulting.com/wp-content/uploads/protected-uploads/630f8bfc385fd-beware-of-people-bearing-gifts-2.pdf>.

89 Emile Dirks and James Leibold, “Genomic Surveillance,” Australian Strategic Policy Institute, June 17, 2020, <https://www.aspi.org.au/report/genomic-surveillance>. Also see Sui-Lee Wee and Paul Mozur, “China Uses DNA to Map Faces, with Help from the West,” *New York Times*, Dec. 3, 2019, <https://www.nytimes.com/2019/12/03/business/china-dna-uighurs-xinjiang.html>.

90 Steve Friess, “Concerns Over Chinese Genomics Bid,” *Politico*, Dec. 4, 2012, <https://www.politico.com/story/2012/12/concerns-arise-in-chinese-bid-for-genomics-firm-084516>.

91 “DOD Releases List of People’s Republic of China (PRC) Military Companies in Accordance with Section 1260H of the National Defense Authorization Act for Fiscal Year 2021,” U.S. Department of Defense, Oct. 5, 2022, <https://www.defense.gov/News/Releases/Release/Article/3180636/dod-releases-list-of-peoples-republic-of-china-prc-military-companies-in-accord/>.

92 “BGI,” Mapping China’s Tech Giants, Australian Strategic Policy Institute, accessed Nov. 30, 2022, <https://chinatechmap.aspi.org.au/#/company/bgi>; and Zachary Basu, “U.S. Blacklists Chinese Companies Tied to Xinjiang Gene Bank Project,” *Axios*, July 20, 2020, <https://www.axios.com/2020/07/20/bgi-china-entity-list-uighur-gene-bank>.

93 Analysis by Fathom Consulting on financial flows and academic research suggests that blocking merger and acquisition deals from China is unlikely to have a macroeconomic impact on the United States, but it might slow technological progress in China. Britton, “Beware of People Bearing Gifts.”; and Cristina Jude, “Does FDI Crowd Out Domestic Investment in Transition Countries?” *Economics of Transition and Institutional Change* 27, no. 1 (January 2019): 163–200, <https://doi.org/10.1111/ecot.12184>.

that the United States is not selling its crown jewels to China and enabling its systemic repression of human rights, as it has done in the past.⁹⁴

The United States should also create a mechanism to screen *outbound* investment to prevent U.S. investors from contributing, wittingly or unwittingly, to China's advance in strategic technologies at America's expense. Oftentimes, it is the know-how that accompanies U.S. investments, rather than the money itself, that facilitates China's advance. A new mechanism should include the authority to review and, when required, restrict transfers of expertise, technology, and capital. For example, U.S. firms participated in 58 investment deals with China's semiconductor industry from 2017 through 2020,⁹⁵ contributing to China's progress in a sector where it is imperative that the United States remains ahead.

Lastly, the United States should find ways to restrict Chinese access to U.S. markets in critical industries where China is racing to catch up to and surpass the United States. America has done this in the past with positive results. In 2011, for example, Congress blocked Chinese access to America's space industry owing to concerns that U.S. technology would be used to advance China's military capabilities.⁹⁶ More than a decade on, American firms lead in commercial space launches, unhindered in the home market by China's brute force economics.⁹⁷ To take another example, America's 2014 ban on Nucotech for security reasons means that, today, the United States — unlike countries in the European Union⁹⁸ — is not experiencing a flood of unreliable border security and scanning equipment from a Chinese national champion at its

ports and airports. The United States should explore reforming, and then using more aggressively, the International Trade Commission's Section 337 process to block the import of Chinese products that have benefitted from unfair trade practices like intellectual property theft.⁹⁹

When an outright ban on market access for Chinese companies is not feasible, the United States should develop laws, policies, regulations, and guidelines that set strict standards for transparency and accountability for the import, purchase, or use of sensitive technology products such as surveillance equipment, hardware and software for data systems, dual-use items, and components for critical infrastructure. Country-of-origin requirements, for example, could place restrictions on products and services from firms in countries of concern including China, preventing such products from being used in sensitive areas such as critical infrastructure.¹⁰⁰ The principle of rebuttable presumption, a policy innovation of the Uyghur Forced Labor Protection Act, should also inspire additional laws and policies to increase transparency and accountability for U.S. persons wishing to pursue transactions involving technology transfer to, or cooperation with, China. For example, export controls and licensing policies should be updated to address the risk posed by China's military-civil fusion strategy that technology or expertise transferred to China could benefit the People's Liberation Army. If the U.S. person wishing to conduct the transaction can provide satisfactory evidence that the transaction would *not* be detrimental to national security and competitiveness, the transaction could be permitted to proceed.¹⁰¹ The onus

94 Kathleen M. Vogel and Sonia Ben Ouagrham-Gormley have argued in this journal that concerns about China's access to U.S. biomedical big data often fail to account for the challenges of using such data for any applied purpose. See "China's Biomedical Data Hacking Threat: Applying Big Data Isn't as Easy as It Seems," *Texas National Security Review* 5, no. 3 (Summer 2022): 83–98, <https://tnsr.org/2022/04/chinas-biomedical-data-hacking-threat-applying-big-data-isnt-as-easy-as-it-seems/>. I argue that Beijing's track record of using brute force economics in other sectors, its articulation of its long-term intentions to lead in critical technologies, and its use of foreign-acquired technology to develop lethal military capabilities and conduct mass surveillance and other abuses against its ethnic minorities all raise significant concerns for the United States — regardless of whether or not Beijing is able to use any data it obtains, licitly or illicitly.

95 Kate O'Keefe, Heather Somerville, and Yang Jie, "U.S. Companies Aid China's Bid for Chip Dominance Despite Security Concerns," *Wall Street Journal*, Nov. 12, 2021, <https://www.wsj.com/articles/u-s-firms-aid-chinas-bid-for-chip-dominance-despite-security-concerns-11636718400>.

96 "Department of Defense and Full-Year Continuing Appropriations Act, 2011" 112th Congress, Public Law 10, Section 1340, <https://www.congress.gov/112/plaws/publ10/PLAW-112publ10.htm>. This was colloquially known as the "Wolf Amendment."

97 Stephen Clark, "U.S. Companies, Led by SpaceX, Launched More than Any Other Country in 2020," *Spaceflight Now*, Jan. 5, 2021, <https://spaceflightnow.com/2021/01/05/u-s-companies-led-by-spacex-launched-more-than-any-other-country-in-2020/>.

98 Kinetz, "Security Scanners Across Europe Tied to China Govt, Military."

99 For a proposed approach to reforming Section 337 to better address China's policies that harm U.S. competitiveness, see Robert D. Atkinson, "How to Mitigate the Damage from China's Unfair Trade Practices by Giving USITC Power to Make Them Less Profitable," Information Technology and Information Foundation, Nov. 21, 2022, <https://itif.org/publications/2022/11/21/how-to-mitigate-the-damage-from-chinas-unfair-trade-practices/>.

100 The United States has taken similar steps before, for example, prohibiting the Department of Defense from acquiring printed circuit boards from countries of concern. For more on this and additional proposals to insulate the U.S. market from Chinese distortions, see Special Competitive Studies Project, "Restoring the Sources of Techno-Economic Advantage," 62–64.

101 This standard of "rebuttable presumption," was applied in the Uyghur Forced Labor Prevention Act in 2021. For more information, see Special Competitive Studies Project, "Mid-Decade Challenges to National Competitiveness," chap. 2, section on "Pushback." On the Uyghur Forced Labor Prevention Act and "rebuttable presumption," see Marti Flacks, "The Uyghur Forced Labor Prevention Act Goes into Effect," Center for Strategic and International Studies, June 27, 2022, <https://www.csis.org/analysis/uyghur-forced-labor-prevention-act-goes-effect>.

would thus be shifted to industry to take steps proactively to avoid harmful transactions taking place.

Diversifying to Build Collective Resilience and Self-Defense

As the United States and its allies come to grips with the reality that China has no intention of undertaking structural reforms that could make a level playing field a reality, they must adopt the more realistic and sustainable objective of collective resilience and self-defense. This entails using their combined economic leverage to blunt the harmful effects of Beijing's techno-economic strategy. Some U.S. allies will be concerned by the threat of China's economic coercion, but the recent experiences of Sweden, Australia, and Lithuania demonstrate that countries can successfully stand up to coercion.¹⁰²

To better resist coercion and reduce the risks associated with overdependence on China, the United States and other market-oriented democracies should strengthen trade, investment, financial, and technology ties among themselves while partially disentangling from the Chinese economy. This could evolve into the "partial liberal system" that Aaron Friedberg has described in these pages: a group made up primarily, though not exclusively, of democracies that would resemble the economic arrangement the United States built during the Cold War.¹⁰³ The United States should start by assembling small groups of countries with shared concerns and form trade blocs that withhold market access from Chinese companies in specific industries unless they meet stringent conditions specified by the bloc. Membership in these small groups could be expanded over time.

Given growing skepticism among Americans

about the economic benefits of trade,¹⁰⁴ moving in this direction will not be easy. New trade arrangements will require careful consultation with the U.S. public and lawmakers, whose skepticism of new trade deals has prevented U.S. membership in blocs proposed to reduce dependence on China — the Trans-Pacific Partnership and the Transatlantic Trade and Investment Partnership. Domestically, U.S. policymakers will need to develop compelling arguments about how trade can benefit American workers in the 21st-century economy. Internationally, policymakers can continue to promote the goal of a global, rules-based order as a long-term ideal, while taking an incremental approach to building a new partial liberal order. As Hal Brands and Michael Beckley point out, the challenge of collective action makes it hard to build "big clubs" of countries, but even a "patchy collection of mini-lateral agreements would build multilateral resilience against Chinese pressure by reorienting strategic supply chains away from Beijing."¹⁰⁵

Groupings could focus on issues such as greentech, digital trade, and supply chain security, areas in which allies share far more in common with each other than with China. For example, the United States and the European Union could pursue a carbon border adjustment mechanism that would impose high tariffs on carbon-intensive imports while lowering tariffs for countries whose exports meet specified conditions for clean production. Since China lags well behind the United States and its allies in low-carbon manufacturing, this would effectively exclude the former.¹⁰⁶ To take another example, the United States should work to expand digital trade among democratic market economies while limiting data flows to China.¹⁰⁷ As Agatha Kratz and Janka Oertel point out, "[T]here are significant economies of scale in digital industries."¹⁰⁸ To build resilience in

102 On Sweden and Lithuania, see Viking Bohman, "The Limits of Economic Coercion: Why China's Red-Line Diplomacy Is Failing in Lithuania and the Wider European Union," The Swedish Institute of International Affairs, November 2021, <https://www.ui.se/english/research/swedish-national-china-centre/Publications/the-limits-of-economic-coercion/>. On Australia, see Benjamin Herscovitch, "Australia's Answer to China's Coercive Challenge," *RUSI*, Aug. 18, 2021, <https://rusi.org/explore-our-research/publications/commentary/australias-answer-chinas-coercive-challenge/>.

103 Aaron L. Friedberg, "The Growing Rivalry Between America and China and the Future of Globalization," *Texas National Security Review* 5, no. 1 (Winter 2021/2022): 95–119, <https://tnsr.org/2022/01/the-growing-rivalry-between-america-and-china-and-the-future-of-globalization/>.

104 Mohamed Younis, "Sharply Fewer in U.S. View Foreign Trade as Opportunity," Gallup, March 31, 2021, <https://news.gallup.com/poll/342419/sharply-fewer-view-foreign-trade-opportunity.aspx>.

105 Hal Brands and Michael Beckley, *Danger Zone: The Coming Conflict with China* (New York: W.W. Norton, 2022), 164–65. Brands and Beckley note that seven of America's closest treaty allies — Australia, Canada, France, Germany, Japan, South Korea, and the United Kingdom — collectively outspend China on research and development, account for nearly a quarter of the global economy, and produce many chokepoint technologies that the United States does not dominate. Adding U.S. GDP and research and development spending increases these totals significantly.

106 Catrina Rorke, "The Case for Climate and Trade," Center for Climate and Trade, Climate Leadership Council, May 2022, <https://clouncil.org/reports/Case%20for%20Climate%20and%20Trade.pdf>.

107 See Nigel Cory, "Writing the Rules: Redefining Norms of Global Digital Governance," Information Technology and Innovation Foundation, March 1, 2022, <https://itif.org/publications/2022/03/01/writing-rules-redefining-norms-global-digital-governance/>; and David Feith, "The Strategic Importance of a U.S. Digital Trade Agreement in the Indo-Pacific," Testimony Before the U.S. House Foreign Affairs Committee Subcommittee on Asia, the Pacific, Central Asia, and Nonproliferation, Jan. 19, 2022, <https://s3.us-east-1.amazonaws.com/files.cnas.org/documents/HFAC-David-Feith.pdf?mtime=20220119150405&focal=none>.

108 Kratz and Oertel, "Home Advantage," 18.

critical supply chains, the United States and its allies and partners should enhance coordination through mechanisms such as the Minerals Security Partnership announced in June 2022 by the State Department to build robust, responsible supply chains for critical minerals.¹⁰⁹

Conclusion

It is time for Washington and its allies and partners to acknowledge that ever-deepening techno-economic integration with China is not in their best interest. Twenty years ago, it was understandable that the dazzling promise of making economic gains through trade blinded Western policymakers to Beijing's long-term objectives. But in 2022, it should be obvious that China is not a cooperative economic and technology partner. It is anachronistic — and even dangerous — to make policy choices contingent on a false hope that it will become one.

Imagine you are a small farmer unlucky enough to live next door to a neighbor who, after years of buying your produce, turns into a predator intent on driving you out of business. She steals your tools, seeds, and tractor, then hacks into and steals the database of your distribution networks. With help from the local mafia, she buys out all the small farms and locally owned grocery stores in the region, becoming the area's sole grocer. Hoping she will play fair is fruitless. At this point, maintaining an "open door policy" would be preposterous. Instead, prudence would dictate installing a more powerful security system and deepening friendships with other neighbors, working together to grow a community garden and organizing to defend yourselves. Over time, practicing resistance, resilience, and interdependence with friends would become a normal response to the predatory neighbor. 🦋

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Image: Keith Skipper (CC BY-SA 2.0)¹¹⁰

109 "Minerals Security Partnership," U.S. Department of State, June 14, 2022, <https://www.state.gov/minerals-security-partnership/>.

110 For the image, see https://commons.wikimedia.org/wiki/File:CSCL_Globe_arriving_at_Felixstowe,_United_Kingdom.jpg. For the license, see <https://creativecommons.org/licenses/by-sa/2.0/deed.en>.