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Affairs Subcommittee on Economic Policy**

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Dr. Melanie Hart

Senior Fellow and Director for China Policy

Center for American Progress

Chairman Cotton, Ranking Member Cortez Masto, and distinguished Members of the Subcommittee, thank you for the opportunity to testify before you today.

The global economy is entering a period of great change. The fourth industrial revolution is beginning to unfold. Digital networks are now fast enough to enable a previously unimaginable array of devices to work in concert, ushering in new applications such as self-driving cars and AI-powered manufacturing. We do not yet know exactly what this revolution will bring, but we know it will involve fundamental change.

Chinese leaders view this transition as their nation’s strategic opportunity. Chinese president Xi Jinping frequently states that “the world is undergoing profound changes unseen in a century.” Beijing sees the United States drifting, squandering its resources, and allowing its comparative advantages—the advantages that China cannot match—to atrophy. In the 20th century, the United States invested unwaveringly in the foundations of its own power, building the world’s leading innovation economy. But since the early 2000s the United States has faltered. Instead of investing in its own competitiveness, it coasted on investments made decades ago. Now, as a new industrial revolution dawns, the United States is losing its edge.

Meanwhile, Beijing has sought to beat the United States at its own game: investing in the foundations of its own domestic economic power the way the United States did in previous decades. Beijing knows drifting nations do not prevail in industrial revolutions. Chinese leaders see a once-in-a-century opportunity to catch up to and potentially surpass the United States, and they are dedicating massive resources to achieve that goal. In addition to making smart investments modeled on previous U.S. success, Beijing is also deploying market-distorting industrial policies to siphon technical know-how from the United States, tilt global markets in China’s favor, and speed the catching-up process. When measured in domestic purchasing

power, China's GDP already surpasses that of the United States. Beijing's ultimate aim is to reshape the global economic order, bringing about a system in which China is the dominant economic and technical power and the Chinese Communist Party determines which firms, technologies, and ideas succeed in global markets.

If China prevails, there is a risk the United States and the world will be less free, less prosperous, and less safe. The United States does not need to engage China in a Cold War to avoid this outcome. However, it does need to put its own ideas on the table internationally, advocate for that vision, reassert global leadership, and rectify a pattern of serious missteps at home.¹ On the economic front, the U.S. has a near-term opportunity to respond to this challenge in ways that will put our nation on a path to prosperity for decades to come. To prevail, the U.S. must do two things effectively: (1) double down on its own comparative advantages—the advantages that China cannot match; (2) build a broad global coalition to effectively counter and neutralize China's predatory behavior.

This testimony will cover four main points:

1. Over the past two decades, China prioritized investing in the foundations of economic power; the United States did not. That is why China is now our peer competitor.
2. In addition to investing at home, Beijing deploys predatory industrial policies that siphon off U.S. technology advantages and boost Chinese firms over their American competitors.
3. Beijing is responding to the Trump administration's policies by doubling down on both the domestic investment and predatory aspects of its economic strategy.
4. The United States must do two things to compete at full strength: invest in its own comparative advantages; form broad coalitions to neutralize China's predatory behavior.

Investment disparities erode U.S. innovation edge

For decades, Beijing has funneled state resources into building the foundations of economic power: education, infrastructure, R&D, and higher-end manufacturing capabilities. During the same time period, U.S. investments in its own foundations have remained relatively flat. That disparity plays a critical role in the declining U.S. edge vis-à-vis China.

Research and Development: For decades, the United States has been the world's largest R&D spender, and those investments gave it an edge in global innovation. However, the United States has not adjusted its R&D strategy to keep up with rapid technology developments, and China is now on track to surpass the United States and may have already done so. Total global R&D spending tripled from 2000 (\$722 billion) to 2017 (\$2.2 trillion), growing an average 11% percent per year.² Over that same time period, China's R&D spending grew an average 17% per year while U.S. spending grew just 4.3% per year. In 2000, the U.S. spent \$268 billion on R&D,

dwarfing China's \$33 billion. By 2010, China had narrowed the gap (spending \$213 billion) but was still substantially behind the U.S. (\$408 billion). In 2015 China surpassed Europe as the world's largest R&D spender. Between 2015 and 2017 the remaining U.S.-China spending gap shrank by 40%. As of year-end 2020, China may now have surpassed the United States.

China rapidly caught up to the United States because U.S. spending as a percentage of GDP has remained relatively flat: it was 2.6% in 2000 and 2.8% in 2017. The world entered the digital era, but the United States did not change its R&D investment strategy. China did not make the same mistake.

Infrastructure: A similar pattern is playing out in public infrastructure. While China invests in a world-class system, the United States forces its workers and companies to make do with aging infrastructure built in and designed for the 1960s. Since the early 1990s, the United States has spent an average 2.4% of its GDP on public infrastructure (roads, rail, telecommunication, utility, airport, and seaport projects). In contrast, most European nations spend 5% of their GDP per year. In recent years, in the face of rising global economic competition and the digital revolution, U.S. infrastructure spending actually decreased. The American Society of Civil Engineers gives the overall U.S. public infrastructure system a D+ rating.

In contrast, China spends an average 8.5% of its GDP on public infrastructure per year. In response to the COVID crisis, Beijing rolled out a stimulus program that pledges to invest \$1.4 trillion in high-tech "new infrastructure" projects through 2025. The goal is to speed the nation's deployment of next-generation digital infrastructure systems, particularly 5G mobile communication networks, AI-empowered manufacturing, high-speed rail, EV charging systems, and internet-of-things application. If these programs are even partially successful, they will give Chinese firms an edge over their American counterparts and boost productivity across the Chinese economy.

The United States would not send its military into today's battles with Cold War weaponry, but it sends its workers into 21st century economic competition with 20th century infrastructure. That is a gift to Beijing.

Last year Senator Cortez Masto supported two critical bills that aim to address U.S. infrastructure deficits: the *ACCESS BROADBAND Act* and the *Moving and Fostering Innovation to Revolutionize Smarter Transportation (Moving FIRST) Act*. Those bills represent good steps forward, but more work is needed to equip our nation for success.

Predatory policies boost China at U.S. expense

The other half of Beijing's strategy is a collection of market-distorting industrial policies. In the early stages of China's reform and opening, it provided low-cost manufacturing for foreign firms. That approach forced China to rely on other nations for high-end technology. In Beijing's

view, that position brought insufficient profit margins and unacceptable security risks. China aimed to catch up to the United States and other leading innovation nations and supplant them at the top of global value chains. If it relied solely on capacity-building strategies such as smart investments in education, R&D, and infrastructure to do so, it would still be many decades away from success. Beijing decided to speed the process by deploying three powerful Chinese assets to boost China at U.S. expense: (1) China's massive domestic market; (2) Beijing's ability to control access to that market, either shutting foreign firms out or forcing them to pay concessions to gain access; (3) massive state funds, which Beijing deploys through subsidies and state bank loans to boost favored Chinese firms over their American competitors. Beijing leverages those assets to achieve the following goals:

Technology and production transfers: Beijing controls access to the nation's massive domestic market, and it leverages that control to coerce foreign firms into transferring critical technology to Chinese partners and moving their production operations to China. When foreign firms do not agree to those transfers, Beijing does not allow them to sell their products in China. When they do, Beijing leverages those transfers to move Chinese firms up the value chain. For example, in 2005 Beijing issued local content regulations requiring wind farms to source at least 70 percent of their components from domestic suppliers. At that time, no such suppliers existed in China, so foreign wind companies trained Chinese manufacturers to serve as their suppliers in order to meet the quota. Beijing funneled subsidies to the Chinese manufacturers, enabling them to rapidly build capacity and edge the foreign firms—their original technology donors and customers—out of China and then the global market.

In recent years, market access requirements are more frequently conveyed via closed-door deal-making that is harder to track. For example, in the aviation sector, aircraft manufacturers that do not form a joint venture or move assembly operations to China are less likely to win contracts from China's state-owned carriers.³ In the electric vehicle sector, Beijing is dropping explicit joint venture requirements but foreign firms seeking to operate without a Chinese partner are reportedly running into problems acquiring licenses.

State-directed market displacement: Beijing directs Chinese firms to displace foreign competitors in critical technology markets and provides targeted state support to help them achieve their goals. Some aspects of that process are shockingly transparent. The Made in China 2025 Key Technology Roadmap lists market-takeover targets for 10 sectors that Beijing views as critical to the nation's economic competitiveness: information and communication technology (ICT); advanced machine tools and robotics; aerospace technology; ocean engineering; advanced rail; new energy vehicles; electricity equipment; agriculture equipment; new materials; biopharmaceutical and medical equipment.⁴ For each sector Beijing identifies high-priority sub-sectors, assigns a take-over target, and funnels state resources to Chinese firms to help them achieve it. For example, in mobile telecommunications equipment, the roadmap calls for Chinese firms to capture 75% of China's domestic market by 2020 and 80% by 2025. Globally, it calls for Chinese firms to capture 35% of the global market by 2020 and 40%

by 2025. To meet the domestic target, Beijing ordered China's state-owned mobile operators to source 70% of their 4G network equipment and 90% of their 5G equipment from Huawei and ZTE.⁵ China has the largest domestic mobile market in the world, and Beijing gives Huawei and ZTE protected access. That protection gives Huawei and ZTE massive sales revenues, economy of scale, and deployment experience that foreign firms cannot match, all benefits that Huawei and ZTE can then leverage to expand their global market presence. In the first half of 2020, Huawei and ZTE captured just over 40% of all global telecom equipment market revenues. Beijing's champions are meeting their take-over targets ahead of schedule.

Deterring enforcement: The above-mentioned policies artificially increase global economic dependence on China, which Beijing then leverages to deter other nations from pushing back. For example, earlier this year, as European nations considered whether to ban Huawei from their 5G networks, Beijing threatened to retaliate by blocking Nokia and Ericsson from shipping components from their manufacturing centers in mainland China to their overseas buyers.⁶ In May 2019, shortly after the Trump administration announced its intention to add Huawei to a Commerce Department entity list, Chinese President Xi Jinping signaled that Beijing could retaliate by blocking U.S. access to rare earth shipments from China.⁷

U.S. investment deficits continue as Beijing doubles down

Unfortunately, the Trump administration did not make meaningful progress on the China challenge. On the investment front, it did not prioritize critical U.S. R&D and infrastructure investments to enable the United States to compete at full strength; on the trade front, the administration's phase one trade deal did not take meaningful action to address China's predatory industrial policies. The administration did target certain beneficiaries of those policies, such as Huawei and ZTE. However, the Trump administration too often acted alone instead of building a broad coalition of nations to take joint action alongside the United States, and it did not adequately plan for or hedge against the downside effects of its policies. One result: in the semiconductor sector, some third-country firms are reacting to the Huawei entity listing by designing U.S. semiconductors out of their products, and U.S. semiconductor revenues are declining.⁸

Meanwhile, Beijing is doubling down. If the Trump administration's goal was to force Beijing to abandon its economic and trade policies, that effort has officially failed. Last month Chinese leaders issued a communique signaling the direction they plan to take their nation during the 14th five-year plan period, which will run from 2021 to 2025.⁹ The communique states that Chinese development is occurring within a "profound adjustment in the international balance of power," code for U.S. decline. Chinese leaders pledge to "successfully fight the tough battles for key and core technologies" and to exploit China's massive domestic market to turn "China into a trade powerhouse." The communique does not signal a change in China's economic

strategy. Instead, three themes suggest that Beijing is ramping up its ambitions, particularly on the technology front:

- *Dual circulation*: The communique echoed Chinese President Xi Jinping’s call to prepare the Chinese economy for further decoupling from the United States and other major economies, and to do so in a way that works best for China. What this actually means in practice is still unclear, but the United States should expect more efforts to replace U.S. high-tech products with home-grown Chinese versions.
- *Independent controllability*: The communique states that China aims for secure supply chains with “independent controllability,” which is another code word for boosting domestic suppliers and either shutting foreign companies out of China’s market or forcing them to hand over proprietary data and source codes.
- *Strategic emerging industries*: The communique rehabilitates this term, which Beijing used to designate high-priority sectors prior to the launch of the Made in China 2025 plan. The communique lists most of the sectors covered under the 2025 plan, with one notable addition: green energy. The original Made in China 2025 plan focused more narrowly on energy-efficient vehicles and electricity equipment; the new communique broadens that out to include new energy, new energy vehicles, and green and environmentally friendly products.

Going forward, Beijing’s industrial policies may become increasingly difficult to track. In June 2019, during the heights of the Trump administration’s trade war, Chinese Vice Premier Liu He visited the Chinese Academy of Sciences and told the nation’s top researchers to maintain a “low profile” in their work.¹⁰

Beijing appears to have taken two big lessons from the Trump era: do more, faster; do it quieter, so the United States and other nations struggle to identify exactly what China is doing and how they should react.

It is time to compete at full strength

The United States has woken up to the fact that China is now a major peer competitor. It has woken up to the fact that victory is not assured. But the United States has not yet rallied around a single, coherent strategy for success. Beating the drums of a new Cold War is not the answer. Beijing can beat those drums just as loudly and effectively as Washington can. Instead, the United States should focus the majority of its resources on strengthening its own comparative advantages, the advantages that Beijing cannot match: our democratic values, our open innovation system, our allies and partners, and the boundless potential of the American people. The United States has allowed all of these advantages to atrophy, but we still have time to turn the trend lines around. Specific steps include:

Launch a National Competitiveness Initiative: The United States needs to treat this challenge as a “Sputnik moment” and rally around a National Competitiveness Initiative that makes key long-term investments in its comparative advantages. That should include making high-quality postsecondary education affordable for all Americans, rebuilding workforce development infrastructure, making moonshot investments in national R&D, and investing in productive public infrastructure. The *America Labor, Economic competitiveness, Alliances, Democracy and Security (America LEADS) Act* gets these fundamentals right, but urgent action is needed to resource these initiatives.

Make targeted investments to reduce U.S. supply chain dependence on China and speed time to market for disruptive innovations: Targeted public investments are needed to maintain the existing U.S. innovation edge and help U.S. firms overcome the market barriers Beijing has created through decades of distortionary industrial policy. For example, U.S. semiconductor firms are highly reliant on exports to China to generate revenue for R&D, and Beijing is hoping to replace U.S. chips with home-grown alternatives. Beijing has not yet succeeded, but the United States should not bet on Chinese failure. Instead, the U.S. should make targeted investments in domestic semiconductor R&D and fab capacity to maintain and grow the U.S. innovation edge and reduce U.S. reliance on overseas manufacturing facilities and export revenues. The *American Foundries Act of 2020*, which Senator Cotton supported earlier this year, is a great step forward, but more funding is needed, not only in semiconductors but also in other critical sectors such as 5G.

Form a coalition of nations to push back against Beijing’s predatory economic policies: When the United States frames the China challenge as a Cold War, the U.S. stands and fights alone. That strategy benefits China at U.S. expense, because it undercuts one of the biggest advantages we have: other nations share our concerns. When China distorts global markets that is not just a U.S. problem. That is a global problem. When the United States takes unilateral action to address a global problem, we carry water for other nations and pay unacceptable costs. That is exactly what happened with the Trump administration’s trade war. It is time to pivot to a new approach, one that builds a broad global coalition, minimizes the costs to the American people, and puts China on its back foot. The United States should start with critical high-tech sectors: that is where China is focusing its efforts, and that is where we share clear common interests with allies in Europe, Asia, and the Americas. The U.S. should immediately:

- Form a coalition of democracies to develop common principles and standards for digital technology governance. The European Union is already reaching out to propose forming a transatlantic technology alliance that could “form the backbone of a wider coalition of like-minded democracies” on high-tech issues.¹¹ This outreach presents an ideal opportunity for the United States to change course and work in concert with other nations instead of standing alone.

- Form a coalition of nations to assess how Beijing’s direct and indirect subsidies harm global markets—starting with mobile telecommunications—and devise appropriate trade remedies.¹²
- Conduct a comprehensive review to assess how Beijing uses credit to advantage Chinese firms over their competitors, and engage the G-7 industrialized democracies to develop new rules limiting those actions.
- Form a coalition of export credit agencies to support vendors seeking to compete against Huawei and the loans Chinese state banks offer its customers.
- Engage the key 5G standardization partners—the European Union, Japan, India, and South Korea—to improve leadership transparency and diversity at the ITU.
- Push the ITU to adopt the O-RAN fronthaul interface as a common global standard.

Thank you and I look forward to your questions.

¹ Melanie Hart and Kelly Magsamen, “Limit, Leverage and Compete: A New Strategy on China,” Center for American Progress, April 2019.

² R&D spending data from National Science Board, “The State of U.S. Science and Engineering 2020,” January 2020, available at <https://nces.nsf.gov/pubs/nsb20201/global-r-d>.

³ Keith Crane et al, “The Effectiveness of China’s Industrial Policies in Commercial Aviation Manufacturing,” Rand Corporation, 2014.

⁴ US-China Business Council, “Unofficial USCBC Chart of Localization Targets by Sector Set in the MIIT Made in China 2025 Key Technology Roadmap,” available at <https://www.uschina.org/sites/default/files/2-2-16%20Sector%20and%20Localization%20Targets%20for%20Made%20in%20China%202025.pdf>.

⁵ Melanie Hart and Jordan Link, “There is a Solution to the Huawei Challenge,” Center for American Progress, October 2020, available at

<https://www.americanprogress.org/issues/security/reports/2020/10/14/491476/solution-huawei-challenge/>.

⁶ Liza Lin, Stu Woo, and Lingling Wei, “China May Retaliate against Nokia and Ericsson If EU Countries Move to Ban Huawei,” *The Wall Street Journal*, July 20, 2020.

⁷ James T. Areddy, “Xi Jinping Flexes China’s Trade Muscle with Visit to Rare-Earths Hub,” *The Wall Street Journal*, May 21, 2019.

⁸ Antonio Varas and Raj Varadarajan, “How Restricting Trade with China Could End US Semiconductor Leadership,” Boston Consulting Group, March 9, 2020, available at <https://www.bcg.com/en-us/publications/2020/restricting-trade-with-china-could-end-united-states-semiconductor-leadership>.

⁹ For a superb English translation, see: Center for Security and Emerging Technology (CSET), full translation of the “Proposal of the Central Committee of the Chinese Communist Party on Drawing up the 14th Five-Year Plan for National Economic and Social Development and Long-Range Objectives for 2030,” available at file:///C:/Users/Melanie/AppData/Local/Temp/t0237_5th_Plenum_Proposal_EN-1.pdf.

¹⁰ Zhou Xin and Wendy Wu, “China’s leading scientists advised to keep a low profile in their work as US steps up pressure on tech firms,” *South China Morning Post*, June 24, 2019.

¹¹ Sam Fleming, Jim Brunsten and Michael Peel, “EU Proposes Fresh Alliance with US in Face of China Challenge,” *Financial Times*, November 29, 2020.

¹² For more detail on all 5G recommendations, see: Melanie Hart and Jordan Link, “There is a Solution to the Huawei Challenge,” Center for American Progress, October 2020.