Testimony before the U.S.-China Economic and Security Review Commission

Hearing on Consumer Products from China: Safety, Regulations, and Supply Chains

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1. Introduction

Over the last three decades, China has emerged as a global industrial powerhouse. The spectacular growth of the country's manufacturing sector has turned the nation into the world's factory. Initially, much of this growth was based on labor-intensive manufactured goods, such as apparel, footwear, furniture, and consumer electronics. China has since diversified into more technologically advanced products, such as cellphones, laptops, solar panels, semiconductors, and electric vehicles. Although China remains the world's largest exporter of manufactured goods, its period of rapid growth ended more than a decade ago. Today, China is a lumbering economic giant, beset by the inevitable growth slowdown that follows a period of rapid economic opening, policy choices that have undermined the foundation of the country's earlier growth, and rising barriers to its access to foreign capital, markets, and technology. In this testimony, I discuss the origins of China's export manufacturing boom, the reasons behind China's recent move into technologically advanced manufacturing, prospects for continued growth in China's manufacturing sector, and policy options facing the United States.

2. China's Export Boom

One can divide China's export development into three phases, based on its varying pattern of industrial specialization and policies governing international trade and industrial production.

2.1 Initiation of Export Growth: Rise of Export Processing (1992-2001)

China's manufacturing export boom began in earnest in 1992, when Deng Xiaoping expanded the country's process of "reform and opening" to encompass export-led development (Vogel, 2011). Production for foreign markets, often in processing plants owned by or subcontracting for multinational firms, mushroomed in special enterprise zones allowed to operate in select

southeastern coastal cities, before being allowed to spread throughout the country (Yu, 2015; Chen et al., 2019). China's embrace of manufacturing as its engine of growth was a conscious attempt to emulate the success of Japan, Singapore, and South Korea in previous decades. Indeed, Singapore's long-serving Prime Minister Lee Kuan Yew was an informal adviser to Deng during the period in which Deng crafted his reform strategy (Vogel, 2011).

Because of China's long history of central planning, the reform process was complex. It entailed allowing foreign firms to invest in the country and to import foreign machinery and technology (Yu, 2015), creating a more market friendly commercial legal system for firms operating in special enterprise zones (Feenstra and Hanson, 2005), dismantling a system of foreign trading rights in which most firms were required to export through state-owned intermediaries (Bai et al., 2017), consolidating and closing smaller, inefficient state-owned enterprises (Hsieh and Song, 2015), lowering import barriers (Brandt and Morrow, 2017), and relaxing restrictions on internal migration that were embodied in the country's hukou registration system (Fan, 2019). Central to China's export growth was the country's insertion into global value chains, in which export-processing plants in China assembled outputs from imported inputs. Many of these production chains were orchestrated by multinational enterprises based in Hong Kong and Taiwan, with companies from South Korea and Japan also making major investments in the country.

Although Deng's reforms contributed to the rapid expansion of China's export base, the country maintained many barriers global trade and investment. In the second phase of its export growth, China eliminated many of these barriers, not so much because of an internally generated process of reform (as occurred during the first phase of growth), but because doing so was a requisite part of China's entry into the World Trade Organization in 2001.

2.2 China's Entry into the WTO: Export Diversification and Acceleration (2001-2010)

China's WTO accession agreement required the country to remove barriers on exports, imports, and foreign investment, and provided it, in turn, with Most-Favored-Nation access to the markets of WTO members.[1] These policy changes helped accelerate China's export growth.

[1] Pierce and Schott (2016) and Handley and Limao (2017) argue that the material impact of China's WTO entry on barriers to its exports was not the actual change in tariffs on Chinese goods among WTO members

Reductions in import tariffs in China gave firms in the country lower cost access to imported inputs and subjected them to greater import competition, leading to higher domestic productivity and lower markups of price over marginal cost. Total factor productivity rose by more in firms facing larger reductions in both input and output tariffs (Brandt et al., 2017). Because imported inputs embody foreign technology, reducing their relative prices unleashes cost-saving and quality-enhancing innovations on the part of firms (Amiti and Konings, 2007; Goldberg et al., 2010). Consistent with this logic, tariff changes in China reduced dispersion in price-cost markups across firms, indicating that trade reform reduced the misallocation of resources within industries (Lu and Yu, 2015). Also contributing to productivity growth was the removal of export restrictions on Chinese firms. China eliminated provisions that required private firms under a specified size to channel exports through state-owned intermediaries. Owing to the inefficiencies of these intermediaries, the practice imposed a substantial effective tax on exporting (Bai et al., 2017). Across all manufacturing industries, the period of trade reform was when China experienced its most rapid TFP growth: average TFP growth was 2.0% per year over 1998 to 2007 and 1.1% per year over 2007 to 2013 (Brandt et al., 2020).

During the second phase of China's export boom, export processing plants accounted for most foreign shipments in manufacturing. In 2005, export processing was responsible for 55% of China's total manufacturing exports (Liu and Ma, 2020). Because of the high import content of these firms' material purchases, the domestic content of China's manufacturing exports was below 65 percent during the 1990s and early 2000s (Koopman et al., 2012; Kee and Tang, 2016). China's later export diversification contributed to a declining importance of export processing, with its share of China's manufacturing exports falling to 35% in 2015, a shift accompanied by an increase in the domestic content of China's foreign shipments.

China's entry into the WTO allowed it to benefit from the dismantling of the Multi-Fiber Arrangement, which had permitted high-income countries to set quotas on apparel and textile

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but in uncertainty over future values of these tariffs, especially in the U.S. Although the U.S. had granted China MFN status in 1980, between 1989 and 2000 the U.S. Congress was required to reauthorize this status annually. Reauthorizations were frequently the subject of heated political debate, suggesting that their passage was not a foregone conclusion. Using a quantitative trade model to compare outcomes in trade regimes with and without uncertainty over U.S. trade policy, Handley and Limao (2017) estimate that China's exports would be approximately 30% larger without the uncertainty.

imports. The MFA was phased out in stages between 1994 and 2005, meaning that China began to enjoy quota-free access to high-income apparel and textile markets after 2001.[2] In China, the allocation of quota rights to firms, favored inefficient producers, many of which were state-owned enterprises (Khandelwal et al., 2013). The elimination of the MFA quotas thus permitted the entry of new firms, whose higher productivity generated a massive increase in China's apparel and textile exports to the European Union and the United States. The result was a 21% increase in TFP in China's apparel and textile production, most of which was due to firm entry (Brandt et al., 2012).

2.3 End of the Export Boom: Rolling back Reform and the U.S. China Trade War (2010-2024)

Although President Xi Jinping is often credited with engineering the rollback of economic reforms in China, in truth this rollback appears to have begun years earlier, under President Hu Jintao. In 2008, Hu gave (low productivity) state-owned enterprises renewed prominence in industrial planning (Naughton, 2016), a shift strongly reinforced by Xi when he came to power in 2012 (Lardy, 2019). After 2007, entry of private and foreign-owned manufacturing firms fell sharply (Brandt et al., 2020). The end of the productivity-growth miracle and the rollback of pro-market reforms slowed manufacturing growth after 2010. Whereas the differential in annual manufacturing export growth between China and the rest of the world was 8 percentage points over 1991 to 2010, it was -0.4 percentage points over the 2010 to 2018 period (which spans China's export growth up to the beginning of the U.S.-China trade war).

In 2018, the United States and China entered a period of rising trade tensions, which culminated in sharply higher trade barriers on each other's products. In early 2018, the U.S. government announced new tariffs on washing machines, solar panels, and steel, which led China and the European Union to respond with retaliatory actions against U.S. exports. In 2019, the United States imposed a 25% tariff on a wide range of Chinese imports, to which China reacted swiftly with retaliatory tariffs on US exports. In under two years, the

[2] Between 1974 and 2004, international trade in apparel and textiles was governed but by the Multi-Fiber Arrangement (MFA), under which high-income countries were allowed to impose import quotas on these products. For other goods, the GATT expressly forbade quotas as a tool of trade policy. The MFA, which grew out of restraints that the U.S. had placed on Japan in the 1950s, was initially billed as a mechanism for high-income countries to wind down production in goods in which their comparative advantage was weak, and in which, because of their labor intensity, employment was relatively high. Yet, the elimination of the MFA did not begin until 1995, with most quotas not removed until the 2002 and 2005 phase outs.

average U.S. tariff on Chinese goods jumped from 3% to 21%, while the average Chinese tariff on U.S. goods increased from 8% to 22%. The escalation of the trade war ended in 2020, when the United States and China reached an agreement that left most tariffs in place but set goals for Chinese imports of U.S. goods.

There is substantial academic research on the U.S.-China trade war (Fajgelbaum and Khandelwal, 2022). This work shows that U.S. tariffs on Chinese imports have resulted in higher prices for U.S. consumers and lower average real income for U.S. households (Amiti et al., 2019, 2020, 2021; Carter and Steinbach, 2020; Cavallo et al., 2021; Handley et al., 2020; Fajgelbaum et al., 2020). In response to higher U.S. tariffs on China, other countries expanded their exports to the United States (Fajgelbaum et al., 2021). In some industries, China has engineered this trade diversion. It has been able to partially avoid U.S. tariffs by relocating final assembly of products to other countries, especially Vietnam. In other industries, Chinese firms have tried to soften the impact of higher tariffs by moving production into inland China, where wages and land prices are lower. Since 2018, exports from inland provinces in China have doubled, growing at twice the rate of exports in China's coastal provinces (Douglas, 2023). Although China's inland shift in production began before the U.S.-China trade war, U.S. tariffs may have reinforced the trend.

3. Composition of China's Manufacturing Exports

During all three phases of China's export growth, the country has diversified its exports away from labor-intensive goods into more advanced products. Whereas in 2000, China's top two exports were footwear and children's toys, by 2007 its top two exports were cellphones and laptop computers (these products have retained their top positions out to the present). This shift was due to the combination of (1) early increases in productivity in China, which pushed up wages and priced the country out of some very labor-intensive goods, (2) rising educational attainment of the Chinese labor force, which lowered the cost of producing technology-intensive goods, (3) policy interventions, which subsidized sectors deemed important by the Chinese state, and (4) U.S. tariffs on Chinese imports, which induced China to relocate production in labor-intensive goods to other countries, including Vietnam and elsewhere in Southeast Asia.

3.1 China's Initial Specialization in Labor-Intensive Manufacturing

China's initial export growth was concentrated in products that are strongly intensive in the use

of labor in production (Hanson, 2017). These goods include: **apparel, bicycles and scooters, footwear, furniture, household fixtures, plastic products, sports equipment, textiles, travel goods, and toys and games**. They are the products through which low-income countries typically enter production for global markets. In their day, Japan, Korea, Singapore, and Taiwan, began their processes of export-led development by first specializing in these goods. China's global collective export market share in labor-intensive goods rose from 6% in 1984 to 23% in 2001, during the first stages of export-led development, jumped to 40% in 2013, after China's accession to the WTO, and then dropped to 32% in 2018, as China began to diversify away from the products (even before the U.S.-China trade war). China's comparative advantage in labor-intensive products actually peaked in the early 1990s. The country enjoyed spectacular export growth in these products, not because its comparative advantage in them was rising, but because China's overall export growth as so high and these goods at the time constituted a large share of the total. Since the early 1990s, the rate of growth of Chinese exports has been faster outside of labor-intensive industries. Their share in China's total merchandise exports rose from 38% in 1984 to 47% in 1993 before declining to 18% in 2013 and then to 14% in 2018.

What caused the end of China's export surge in labor-intensive manufacturing? One factor is the overall deceleration of economic growth in China. The country's post-Deng boom was in part transitional in nature, implying that it would ultimately play itself out (Song et al., 2011). Once trade and other reforms were in place and a substantial share of the labor force had moved from the countryside to cities, growth rates would naturally subside (Brandt and Lim, 2020). Other contributing factors may have included the slowdown and then reversal in the growth of China's labor force (Li et al., 2012) and the rapid increase in college attainment after 2001 (Ma, 2020). These changes appear to have put upward pressure on the relative wages of less-educated workers, thereby eroding China's comparative advantage in apparel, footwear, and similar products. Changes in state policy may have also mattered for the shift. In 2008, President Hu gave (low productivity) state-owned enterprises (SOEs) stronger support via industrial policies (Naughton, 2016), a shift that President Xi later expanded (Lardy, 2019). The reprioritization of SOEs in China's economy has created a drag on productivity growth (Hsieh and Song, 2015; Brandt et al., 2020), possibly hastening the expiration of China's reform-era productivity-growth miracle.

Which countries have gained most export market share in labor-intensive products in the wake of China's slower growth in the sector? Eight Asian countries —Bangladesh, Cambodia, India,

Indonesia, Myanmar, Pakistan, Sri Lanka, and Vietnam—are the largest low-income producers of labor-intensive manufactured goods. Since 2012, three of these—Bangladesh, Cambodia, and Vietnam—have seen the most rapid growth in labor-intensive exports. India and Pakistan are also major players in the sector, owing to their large economic size and low wages, but their growth thus far has been far lower than in Bangladesh and Vietnam. Myanmar and Sri Lanka, for their part, still remain small players in global markets. Among middle-income countries, the largest exports of labor-intensive products are Bulgaria, Romania, and Poland, in Eastern Europe, and Morocco, Tunisia, and Turkey in North Africa and the Middle East.

The growth of Vietnam's manufacturing exports is notable because, similar to China's early growth, much of its export production is in export processing plants that are owned by or contract with multinational enterprises, including many from China. China is now "exporting" to Vietnam the export processing model that it followed in its first phase of export growth. The common practice of export processing is one reason why U.S. tariffs on Chinese imports have not led to expanded employment in U.S. manufacturing (Autor et al., 2024). By producing inputs in China and having Vietnamese firms assemble these inputs into final outputs, China is able to evade U.S. tariffs while still exporting substantial embodied manufacturing content to the U.S. market. (Early evidence of increased Chinese investment in Mexican manufacturing suggests that China may be expanding its use export processing to avoid U.S. tariff barriers.)

3.2 China's Diversification in Sophisticated Manufactured Goods

Today, China has a diversified export base in manufacturing. It is the world's largest exporter of cellphones, laptop computers, and other electronics and these products constitute its largest export categories. Considerable attention has been devoted to the role of China's industrial policy in redirecting the country into advanced manufacturing. A partial list of Chinese policies would include giving firms access to cheap credit via China's state-owned banks, subsidies to firms for the purchase of sophisticated machinery, subsidies to firms for generating patents or achieving other innovation benchmarks, letting firms buy or rent land at discounted prices, inducing foreign firms to transfer technology to Chinese firms, and bans on exports of key raw materials such as rare earths. There is anecdotal and (or) quantitative evidence of the Chinese government engaging in these interventionist policies and that such intervention has increased under President Xi.

At the same time, it is difficult to say how much these policies have affected the structure of Chinese exports and the pace of China's export growth. Understanding the economic impact of industrial policies requires having access to data on Chinese manufacturing firms and to the government policies that affect these firms. Such data on China are available from roughly 1995 to 2016, depending on the industries and policies being considered. However, little data on Chinese firms are available after 2016, presumably due to the government keeping such data out of the public domain. For recent years, we therefore cannot conduct quantitative analysis of productivity growth in Chinese manufacturing, causes of export growth in specific sectors, or how industrial policies have affected Chinese manufacturing industries and exports. We remain in the dark about many recent economic developments in China, especially with regards to advanced manufacturing.

We can say that there are factors besides industrial policy that have contributed to China's recent export growth and its move into advanced manufacturing. One is the rapid educational upgrading of China's labor force. A country's comparative advantage in high-tech products depends heavily on its supply of human capital, which depends in turn on the quality and quantity of a country's institutions of higher education. Between 1999 and 2015, China expanded the number of students enrolled in university by seven times, an increase that is unprecedented. Many have questioned the quality of China's college training, noting high rates of unemployment among recent college graduates (data on which the Chinese government recently began to suppress). It seems plausible that the quality of China's newly expanded university system is uneven. Yet, it is also true that researchers in the best Chinese universities are catching up to researchers in the United States and other countries in the quantity and quality of their academic publications. However many poorly trained college graduates China may be churning out, it appears to be producing enough high-quality students for China to make substantial gains its innovative capacity in many domains.

There is evidence of this impact in data on Chinese manufacturing in the period leading up to 2016 (Ma, 2023). The expanded supply of college grads, which began to be felt in China's labor market in 2004 and later years, led to an increased pace of innovation in Chinese firms specialized in exporting electronics and other sophisticated manufactured goods. In the 12 years after the boom in China's college graduates (2004 to 2016), the share of manufacturing employment comprised of workers specialized in R&D increased by four times and the ratio of spending on R&D to sales in manufacturing firms doubled. Detailed analysis indicates that it was China's advanced manufacturing exporters that

benefited most from the increased availability of workers with university degrees. Over the period 2004 to 2016, the expanded supply of university graduates can account for about three-quarters of the increase in R&D intensity in Chinese manufacturing. These results do not imply that other policies have not mattered for China's progress in advanced manufacturing. But we do see evidence that the skill upgrading of China's labor force has played a large role in its technological progress.

4. Policy Options Facing the United States

What should the United States do, in light of these developments in China? First, we should realize that many of China's recent economic shifts are the result of a natural process of economic development, if one that has played out at a rapid pace in a county of immense size. The country's initial specialization in labor-intensive manufacturing and later move into advanced manufacturing are highly reminiscent of what happened in other East Asian economies during their own phases of export-led development. Like its East Asian neighbors, China's comparative advantage has evolved as it has made large investments in human and physical capital and upgraded the technological sophistication of its companies. When a country changes its mix of factors of production, as occurred through China's massive expansion of its university system and greater openness to foreign investment, its pattern of specialization also changes. In China's case, this has meant graduating from specializing in clothes, shoes, and toys to specializing in mobile phones, computers, solar panels, and electric vehicles. No doubt trade and industrial policies in China and the United States also played an important role in this industrial transition. China's subsidies to advanced manufacturing, combined with U.S. tariffs on Chinese consumer goods, likely accelerated China's move away from labor-intensive manufacturing. For U.S. households, the consequence was higher prices on many consumer goods. Softening the blow was the ability of Bangladesh and Vietnam, among other Asian economies, to expand their exports of labor-intensive products to the United States. If the U.S. government wanted to reduce consumer prices for U.S. households, the most immediate action would be to reduce tariffs on Chinese imports.

Second, the United States should anticipate and accelerate future changes in the global supply of labor-intensive products. China's shift away from labor-intensive manufacturing looks permanent, recent expansions of production of these sectors in interior China notwithstanding. With an eye toward protecting the well-being of U.S. households, there are actions the U.S. government could take that would help secure a steady supply of low-priced

consumer goods, beyond ending the U.S.-China trade war. By virtue of their large supplies of less-educated workers, India and Pakistan would appear to have a strong latent comparative advantage in labor-intensive manufacturing. However, a combination of policies in these economies that effectively tax manufacturing and subsidize agriculture have prevented them from realizing this potential. India, despite its vast low-wage labor force, is primarily and exporter of business services produces by workers with a college education, and Pakistan, which also has a large low-wage labor force, remains a bit player in global supply chains. The United States could hasten India's and Pakistan's rise as producers of consumer goods via a multilateral trade agreement that negotiated a move away from highly distortionary policies in these economies. That negotiations under the auspices of the World Trade Organization have been moribund for the last three decades may be one reason why India and Pakistan have not emerged to take China's place as leading producers of labor-intensive products (similar to how China supplanted other East Asian economies in the 1990s). U.S. leadership in global trade policy could help avoid future disruptions in global supply chains.

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