Dominance by Design: China Shock 2.0 and the Supply Chain Chokepoints Eroding U.S. Security

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Similarities and Differences with the China Shock 1.0

China's integration into global value chains in the early 2000s contributed to a decline in manufacturing employment in the US. Studies of the "China shock" suggest this resulted in job losses of somewhere between 550,000 to 982,000 from 2000 and 2007.¹ By all accounts, this was a historical and unrepeatable event. Afterall, China can only be integrated into global product markets once. Moreover, job losses due to import competition from China all but stopped after 2007.²

Yet developments in China's export sector suggest a new shock has been unleashed on the global economy since 2020. Consider the following statistics. In the original shock, China's share of global exports rose by more six percentage points in volume terms (Chart 1).³ The composition of its exports shifted from consumption goods toward capital goods (Chart 2).⁴ And its trade surplus in manufactured goods increased by nine percentage points of its own GDP and 0.7 percentage points of *global* GDP (Chart 3).⁵

From 2008 to 2020, these dynamics all stalled or reversed, as did US job losses linked to the China shock. China's share of global exports stabilised, at least in volume terms. The product

¹ At the upper end: Autor, David, David Dorn, and Gordan H. Hanson (2013): "The China Syndrome: Local Labor Market Effects of Import Competition in the United States." *American Economic Review* 103, no. 6: 2121-68. At the lower end: Caliendo, Lorenzo, Maximiliano Dvorkin, and Fernando Parro (2019): "Trade and Labor Market Dynamics: General Equilibrium Analysis of the China Trade Shock. *Econometrica* 87, no. 3: 741-835.

 ² Bloom, Nicholas, Andre Kurmann, Kyle Handley, and Philip Luck. 2019. The Impact of Chinese Trade on U.S.
Employment: The Good, the Bad, and the Apocryphal. 2019 Meeting Papers 1433. Society for Economic Dynamics.
³ Author's calculation using CPB World Trade Monitor data.

⁴ Based on two-digit broad economic categories, data downloaded from the UN Comtrade database.

⁵ Author's calculation using China Customs and National Bureau of Statistics data. Global GDP is from the IMF's World Economic Outlook.

mix of its exports hardly changed. And its trade surplus declined sharply as a share of its own output and held relatively steady as a share of global GDP.

Since 2020, however, China's global export share has risen by about four percentage points in volume terms. The product mix of its exports has begun to shift again, this time towards transport equipment and industrial supplies. And its manufactured goods surplus has increased by more than three percentage points of its own GDP and 0.7 percentage points of global GDP. This combination of rapid export growth, industrial upgrading, and import substitution has all the makings of a new China shock.

But there are three critical differences from the early 2000s. First, China's weight in the global economy has risen significantly. Its share of global exports increased from about 4% in 2002 to 13% by 2019⁶, its share of global GDP rose from 4% to 17% at market prices⁷, and its share of global manufacturing increased from 6% to 27%.⁸ This means that smaller shifts in its exports now have larger global implications.

Second, and relatedly, the rest of the world has been less tolerant of China's export gains. According to data from China's Ministry of Commerce, 157 anti-dumping investigations into its industrial practices were opened in 2024, up from 63 in the previous year and the 62 cases opened on average over the preceding 20 years (Chart 4). Of these cases, emerging markets launched 104 investigations, up from 47 in 2023.⁹

Third, and most importantly, the price dynamics behind the new shock are different. Twentyfive years ago, the "China price" was low because Chinese wages were low, environmental regulations were lax, and subsidies for foreign direct investment were generous.¹⁰ This was amplified by an undervalued exchange rate, as the People's Bank of China pegged the renminbi to a depreciating US dollar. Yet China's export prices rose 45% between 2001 and 2007, as wages increased and the PBoC eventually allowed the renminbi to appreciate.

In contrast, China's export prices have fallen in the recent shock, both in absolute and relative terms. And this trend appears to be accelerating. China's export prices fell by 16% between 2022 and 2024, whereas global export prices ex-China were basically flat. This suggests excess capacity has been a larger factor in the recent export surge.

⁶ Author's calculation using the IMF's Direction of Trade Statistics.

⁷ Author's calculation using the IMF's World Economic Outlook database.

⁸ Author's calculation using World Bank data.

⁹ Author's calculations using the case file data from the China Trade Remedies Information website of the Ministry of Commerce of the People's Republic of China. <u>https://cacs.mofcom.gov.cn/index.shtml</u>

¹⁰ Alexandria Harney, The China Price: The True Cost of Chinese Competitive Advantage. Penguin Books, 2008.

The Origins of the New China Shock

The recent export surge has roots that lead back to China's long-running industrial policies, but it was the growth strategy it adopted in 2020 that unleashed a deluge of excess capacity on the global economy. US policies may have encouraged the change in China's growth strategy and have likely amplified the export surge for the rest of the world.

China's industrial policies have targeted seven "strategic and emerging" sectors since 2009: green industry, new energy, next-generation IT, biotechnology, high-end machinery, new materials, and electric vehicles. Then-Premier Wen Jiabao specified these seven sectors when he launched the Strategic Emerging Industries program in 2009,¹¹ and General Secretary Xi Jinping highlighted the same seven sectors in his 2022 report to the National Party Congress.¹²

While the results of this industrial strategy have been uneven, China's export growth has been concentrated in many of the targeted sectors. Lithium-ion batteries, photovoltaic panels, electric vehicles, and memory chips were all amongst the fastest growing product categories in its export basket between 2013 and 2023.¹³ Many of these sectors suffer from chronic excess capacity, largely due to local government financial support.

China's industrial policies also contributed to its export surge in less obvious ways. For example, its industrial policies helped to shift domestic demand toward electric vehicles. But this exposed excess capacity in internal combustion engine (ICE) car manufacturing, some of which was then redirected toward foreign markets. China's passenger car exports rose more than five-fold between 2020 and 2023, when it became the world's largest car exporter. Its electric vehicles may have captured the world's attention, but more than 70% of this increase came from ICE vehicles.¹⁴

The growth strategy the Communist Party approved in 2020 has been a more important driver of the recent export surge than its long-standing industrial policies. The 14th Five-Year Plan abandoned one of the main headline economic targets of the previous two plans – increasing the share of services in nominal GDP. Instead, the current plan aims to hold the manufacturing share of GDP steady.

https://www.fmprc.gov.cn/eng/zxxx_662805/202210/t20221025_10791908.html

¹¹ "Premier Wen Jiabao: Let science and technology lead China's sustainable development (国务院总理温家宝: 让科技引领中国可持续发展)", Xinhua, November 3, 2009. <u>https://www.gov.cn/ldhd/2009-</u> 11/23/content 1471208.htm

¹² "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, October 25, 2022.

¹³ "Fastest growing" is defined by the increase of each six-digit HS code product category's share of China's total export basket. The share of lithium-ion batteries increased by 1.7 percentage points between 2013 and 2023, for example. Author's calculation from annual data downloaded from UN Comtrade.

¹⁴ Authors calculations from China Association of Automobile Manufacturers data, accessed via Wind.

In my previous testimony to this commission, I argued this strategy runs counter to the normal pattern of economic development.¹⁵ Manufacturing typically peaks as a share of GDP and employment when countries reach the middle-income level. At least until 2020, China fit the pattern. Its manufacturing sector began to decline as a share of GDP in 2011 and employment in 2012.¹⁶ But since 2020, manufacturing's share of output has held basically steady, and its share of employment has increased marginally.¹⁷

This has required tremendous state support. Two programs are particularly relevant. First, bank lending to the industrial sector began to surge in 2020. Annual loan growth to the industrial sector has averaged 24% since, up from 5% in the five years through 2019.¹⁸ More recently, the central government and PBoC have provided subsidies to help manufacturers upgrade their equipment. Purchases of equipment, a component of fixed-asset investment, increased 16% in 2024 while total FAI only rose 3%.¹⁹

This policy pivot back to manufacturing also resulted in considerable collateral damage to China's economy. Most importantly, the redirection of credit toward manufacturers largely came at the expense of real estate developers.²⁰ The imposition of harder limits on developers' leverage ratios in mid-2020 exposed solvency problems at some major firms. Their high-profile debt defaults undermined confidence in the pre-sale system through which about 90% of new homes were bought in the preceding years. The result has been a sustained decline in housing starts, sales, and prices that policymakers have been unable or unwilling to arrest.²¹ The housing bust also exposed excess capacity in construction-linked sectors and shifted the composition of China's exports.

To give one example, China was a middling exporter of construction machinery before 2020. But from 2020 to 2022, its domestic excavator sales nearly halved,²² while its exports of these machines nearly tripled, making it the world's largest exporter.²³ This is a clear example of excess production capacity being offloaded into foreign markets, but it may not meet the strict

¹⁹ Data from the National Bureau of Statistics accessed via Wind.

¹⁵ U.S.-China Economic and Security Review Commission hearing on "Consumer Products from China: Safety, Regulations, and Supply Chains", Friday, March 1, 2024. <u>https://www.uscc.gov/hearings/consumer-products-china-safety-regulations-and-supply-chains</u>

¹⁶ Data from World Bank's World Development Indicators.

¹⁷ Author's calculations based on national data accessed via Wind. Note the manufacturing sector's share of employment only increased because of the decline of employment in construction. Employment in services has continued to grow faster than that in manufacturing, as is typical for countries at China's income level.

¹⁸ Calculations based on the medium and long-term lending data from the PBoC accessed via Wind.

²⁰ Outstanding medium and long-term loans to the real estate sector peaked in Q1 2022, for example.

²¹ Housing starts have fallen by more than 70% in volume terms since Q1 2021. The floorspace sold of new homes is down by more than 50% since then. And existing home prices have fallen by more than 15%. All are author's calculations from National Bureau Statistic data accessed via Wind.

²² Authors calculation from industry data sourced from Wind.

²³ Authors calculations from UN Comtrade data.

definition of "dumping." China's major producers sell their equipment at higher markups in foreign markets than they do domestically.²⁴

This is largely because government policies have prevented loss-making firms from exiting markets. Losses from state-owned enterprises have long been tolerated, but before 2019 there had never been a year in which more than 13% of large, private industrial firms posted an annual loss. That's happened every year since, with the share rising to 21% in 2024.²⁵ This put additional pressure on industrial profits and encouraged the most capable firms to look abroad for profitable business.

Finally, it's also worth noting that US policies toward China may have contributed to its recent export surge. The Chinese government's fears about its vulnerability to imported "chokepoint" technologies spiked after the US imposed a denial order on ZTE in 2017 and later sanctioned Huawei. That partly motivated the adoption of its unusual development strategy in 2020. It's why the Five-Year Plan put such emphasis on "self-reliance" in science and technology and the "independent controllability" of the industrial sector.

US tariffs also contributed to the shift in China's export basket toward industrial supplies. Multinationals moved the final assembly stage of their supply chains elsewhere in Asia to avoid US tariffs after 2018, but they continued to rely on Chinese inputs for those products. So, computers and printers have fallen as a share of China's exports, while the share of the components that go into those products has risen.²⁶

Finally, US tariffs may have also encouraged Chinese producers to redirect some exports to other markets. For example, from 2017 to 2020, China's exports to the European Union of products that were subject to higher US tariffs rose by 16 percentage points more than the growth rate of goods that were not subject to US tariff increases.²⁷ Increased competition for new markets may have also encouraged Chinese producers to lower their export prices.

Which Countries Are Most Exposed to the China Shock 2.0?

The new China Shock will be felt most strongly in countries that produce similar products to China, export products in which China's excess capacity has grown, or have a dominant position in the sectors in which China is investing most heavily.

²⁴ For example, Sany Heavy Industry Co. reported a gross profit margin of 30% on its foreign sales in 2024 compared to 21% on its domestic sales. Annual report data, accessed from via Wind.

²⁵ Authors calculations from National Bureau of Statistics data, downloaded from <u>https://www.stats.gov.cn/</u>

²⁶ Based on data from UN Comtrade. "Computers and printers" include HS codes 847130, 847150, 844331, and 844332. "Components" include HS codes 854232, 851779, 85291, and 853710.

²⁷ Exports to the EU of the tariffed goods rose by 76% compared to a 60% increase for those goods not subject to additional US tariffs at the time. Author's calculations from UN Comtrade data.

An Export Similarity Index (ESI) is one way to quantify the potential for disruption.²⁸ An ESI sums up the minimum value of the export share of each six-digit harmonised system (HS) product category in two countries' export baskets. For example, spark plugs make up 0.3% of Germany's exports and 0.15% of China's. So we add 0.0015 to the Germany-China ESI, then move to the next category. Two countries with perfectly matched exports would score a 1, while countries with no overlap would score 0.

Chart 5 shows the ESIs with China for 20 major economies.²⁹ Germany's export basket most closely matched China's in 2023, followed by Vietnam and Italy. Australia had the least overlap in this sample. To visualize how each country's export similarity to China has evolved over time, Charts 6 and 7 show the ESIs over the past 15 years at 5-year intervals for select developed markets and emerging markets, respectively.

Germany's similarity began to increase after 2013 and surged after 2018. In fact, China's similarity to most DMs followed this pattern, although to varying degrees. This suggests China's progress toward the technological frontier accelerated after 2018. In contrast, Vietnam's similarity surged from 2008 to 2018 but has since levelled off.

To better understand how the churn in China's export basket is impacting other countries, we also calculated restricted ESIs. The restricted ESI in Chart 8 measures each country's overlap with only China's fastest growing export sectors.³⁰ The restricted ESI in Chart 9 captures exposure to the sectors that have shrunk the most as a share of China's exports.³¹

Korea appears to be the most exposed to increased competition on this measure. Counterintuitively, though, this hasn't translated into an increase in its overall ESI. That's because Korea mitigated its overall exposure to Chinese competition by specialising in memory chips. The rapid growth of its chip exports made its total exports less similar to China's by shrinking the shares of other overlapping product categories.

²⁸ J. M. Finger and M. E. Kreinin (1979): "A Measure of `Export Similarity' and Its Possible Uses," The Economic Journal, Vol. 89, No. 356, pp. 905-912. <u>https://www.jstor.org/stable/2231506</u>

²⁹ All of the ESI data in this section are the authors calculations from UN Comtrade data. The underlying data that is discussed also comes from UN Comtrade, unless otherwise specified.

³⁰ Defined as product categories that that saw a 0.1% or greater increase in export share over the decade to 2023. These 46 categories accounted for nearly 20% of China's exports in 2023.

³¹ Defined as product categories that saw a 0.1% or greater decrease in export share over the decade to 2023. These 37 categories accounted for 11% of China's exports in 2023, down from 22% in 2013.

Such specialisation is common when countries reach the technological frontier³², and may help them to sustain their development³³. But a concentrated export structure can also be a vulnerability if a producer of China's scale enters the market.

ICE vehicles and parts accounted for 20% and 13% of Japan and Germany's exports in 2023, respectively. Although China's ICE exports only rose from 1.7% of its export basket to 3.5% over the decade to 2023, this small change was big enough to make it the largest global exporter of passenger cars. Japan is exposed to a similar threat in construction machinery. Excavators remained a tiny share of China's total exports in 2023 (0.2%) but were more important to Japan (1.4%).

One way to gauge the net exposure of countries to the churn in the composition of China's exports is to subtract the restricted ESI for the sectors that are shrinking in its export basket (Chart 9) from the restricted ESI for those sectors that are growing the fastest (Chart 8). Vietnam screens as having the lowest net exposure on this measure. Malaysia is not far behind. Some capacity in newer technologies is moving to these countries to compete on cost with China (mostly from Korea and Japan). Some is also moving out of China to avoid US tariffs. Meanwhile, they're also gaining market share in lower value-added industries that are leaving China. So their net convergence toward China's export basket has been negligible.

The US also scores well on this measure. Amongst DMs, it has the most overlap in the sectors that China has been exiting and relatively little overlap with the sectors in which China's exports have been growing most quickly. This is why its overall ESI with China has not risen to the same degree seen in other DMs since 2018.

The increase in tariff rates between 2018 and 2020 appears to have resulted in some import substitution of Chinese production. Its overlap with the fastest shrinking sectors in China's export basket has been concentrated in clothing, fully assembled computers and printers, and metal products. To the extent that the tariffs caused economic resources to be redirected to these low value-added products and unskilled production processes, the net effect on productivity has likely been negative.

The US's overlap with the fastest-growing products in China's export basket is concentrated in ICE vehicles and parts, as well as some types of semiconductors. The US's high tariff wall may insulate firms in these sectors from a deluge of cheap Chinese exports, but increased Chinese competition is likely to squeeze their margins on international sales. And, thanks to increased state support, China's industrial policies are showing new signs of success in sectors like

³² Imbs, Jean and Romain Wacziarg (2003): "Stages of Diversification," *The American Economic Review*, vol 93, 64-86.

³³ Hesse, Heiko (2008): "Export Diversification and Economic Growth," Commission on Growth and Development, Working Paper 21.

commercial aircraft, biotech, high-end semiconductors, and artificial intelligence. If it's allowed to continue, the new shock may end up hitting the US hardest in sectors where China's exports have yet to surge and where China's reliance on US imports remains elevated.

Still, at the macro level, other DMs appear to be more exposed to the new China shock, especially those like Germany and Japan that are the established leaders in the legacy industries in which China's excess capacity has grown the most over the past few years.

The New China Shock and Emerging Markets

If some EMs may be the relative winners, why have they taken the lead in launching antidumping investigations into China? One reason is that EMs have been absorbing a larger share of China's exports. At the end of the original China shock in 2008, shipments to other EMs accounted for 28% of China's total exports. That gradually rose to 36% in 2020 and then spiked to 45% by 2024.³⁴

Some this increase was due to the changes in global supply chains mentioned above. More Chinese intermediate goods now go to other EMs, mostly in Southeast Asia, where they are assembled into final goods for export elsewhere, mostly to the US.

Even if final assembly is the lowest value-added production stage, any incorporation into global supply chains can be a catalyst for economic development over the longer run. After all, similar dynamics contributed to the rise of China's manufacturing sector in the 2000s. But taking final assembly work from China comes with risks, too.

Namely, this re-routing of supply chains is a way of recycling China's bilateral trade surplus with the US. The US bilateral deficit with China has fallen since 2017, but this has been more than offset by the rise in its deficit with Southeast Asia and India. US policymakers have already taken some steps to curtail this practice.³⁵ Further action seems likely.

Moreover, the economic benefits of integrating into global value chains have declined, a trend that China's trade practices may exacerbate. There will be less scope for EMs to move up the value-added ladder as long as China continues to gain global export share, puts downward pressure on prices at every stage of the supply chain, and runs ever larger trade surpluses in manufactured goods.

But we should not overstate the China shock's importance in undermining export-led growth for other EMs. Countries have been reaching peak industrialization at lower income levels since

³⁴ Authors calculations from IMF Direction of Trade Statistics accessed via LSEG Datastream.

³⁵ US trade officials finalized steep tariffs increases on solar panels from Southeast Asia in April 2025.

1990.³⁶ One reason may be that slicing global value chains into ever more discrete processes reduced the value-added embedded in the production stages that are outsourced to EMs.³⁷ Regardless, most EMs seem to believe the opportunities from taking over final assembly work from China outweigh the potential costs, at least for now.

Instead, the anti-dumping investigations launched by other EMs suggest their primary concern has been cheaper Chinese products undercutting local producers of low-end metal products, plastics, synthetic fibers, and the like. EM governments appear most worried about job losses in these low value-added sectors. This suggests last year's spike in anti-dumping investigations launched against China was largely due to the decline in China's export prices.

However, the targets of EM anti-dumping investigations differ substantially from those of most DMs. For example, very few EM investigations have targeted transport equipment or capital goods. Instead, many EMs may welcome lower prices for goods they are unlikely to ever produce at scale.

Chinese firms have gained market share in these markets by undercutting the prices of the dominant players, which often still have production facilities in their DM home markets. It may be impossible for these companies to compete in prices in international markets with China without offshoring production to lower wage countries. Again, the US seems relatively insulated from this dynamic. Its export basket is more diversified, and its export-to-GDP ratio is relatively low. But it's certainly not immune.

So far, there has been little coordination amongst EMs to manage the deluge of low valueadded exports from China. One problem may be that China is a major actor in most of the international forums in which other EMs might attempt to coordinate. Another factor may be that EMs are hoping to attract investments from Chinese firms looking to establish offshore production facilities, whether to serve local markets or avoid US tariffs.

Tracking these investments is difficult, largely for the same reasons that tracking outward investment from the US and other countries is difficult. About 75% of China's outward foreign direct investment (FDI) is routed through Hong Kong and other offshore tax shelters. But there does not appear to have been a surge in China's outward investment. China's outward FDI peaked in 2016 at nearly \$200 billion, and reinvested earnings account for a growing share of its annual flows.³⁸ Greenfield investment has declined in absolute terms and as a share of China's

³⁶ Rodrik, Dani (2015): "Premature Deindustrialization," National Bureau of Economic Research Working Paper, February. https://www.nber.org/papers/w20935

³⁷ Baldwin, Richard (2016): *The Great Convergence: Information Technology and the New Globalization*. Harvard University Press.

³⁸ 2023 Statistical Bulletin of China's Outward Direct Investment. https://images.mofcom.gov.cn/fec/202410/20241011091542769.pdf

FDI since 2016. Still, the annual flows are massive. China is the third largest source of outward FDI in the world, and its firms are localising some production in the markets they serve, which is now mostly other emerging markets.

Policy Recommendations for Congress

The US may be relatively insulated from the new China shock, but many of its allies appear to be more exposed to the coming wave of de-industrialization. This includes Germany and others in Western Europe, as well as Japan. Korea's concentration in memory chip production may also be a vulnerability.

As such, Congress should pursue a coordinated response with its allies to confront the domestic policies behind China's recent export surge. US leadership on this issue can be important. When the US highlights China's excess capacities, it encourages others to stand up as well. For example, last year's surge in anti-dumping investigations into China may have been partly inspired by then-Secretary of the Treasury Janet Yellen's comments on the problem during her visit to China in April 2024.

The goal should be to increase China's domestic absorption of its industrial production and to encourage the shuttering of loss-making business in sectors with clear signs of excess capacity. A policy marker for this could be the next Five-Year Plan, which is currently being drafted. International pressure may encourage China to reprioritize the growth of the services sector above that of manufacturing, as it did during the decade when the previous China shock dissipated.

Still, whatever policy path the US takes, and whatever happens to China's domestic absorption ratio, China's government is likely to maintain its focus on developing the seven strategic industries it first identified in 2009. Recent policy statements suggest it will place an even greater focus on science and technology, industrial upgrading, and related efforts in the next five-year plan. The US should not assume that it has an unsurpassable lead in any emerging technologies. Nor should it delude itself into believing that kneecapping China's tech development is a viable long-term strategy.

The US must outcompete China without out trying to out China China. There is scope to increase the government's support across the entire innovation chain without copying China's industrial policies that have contributed to its excess capacity. Funding for universities, research and development, and coordination between universities and the corporate sector can all be increased while still maintaining market discipline. Keeping America's borders open to the best and the brightest should also be a no brainer.

Congress could also use its powers of the purse to improve the efficiency of industries important to its national security. Industrial clusters should be encouraged to boost the

international competitiveness of these industries. Scattering factories across congressional districts may help to protect government funding across election cycles, but it also results in lower productivity and fewer positive spillovers to the broader economy.

Beyond narrow cases of national security, I would not recommend a broad-based effort to reshore production from China. Raising tariffs on China (or the rest of the world) will increase demand for domestically produced import substitutes and shift demand toward non-tradable services. But, since the US economy is already operating near its constraints, the supply for this would likely have to come from the export sector. In this sense, reshoring production is a net negative for productivity and economic growth and will do little to nothing to reduce the trade deficit. However, in limited cases that significantly impact the US's national security, this cost may be worth paying.

Charts





Source: ASR Ltd. / IMF / CPB / LSEG Datastream



Chart 2: Distribution of China's Exports by Broad Economic Category

Source: ASR Ltd. / UN Comtrade



Chart 3: China's Trade Surplus as % of Global GDP

Source: ASR Ltd. / China Customs / IMF / LSEG Datastream



Chart 4: Anti-Dumping Investigations Launched Against China

Source: ASR Ltd. / China Trade Remedies Information



Chart 5: Export Similarity Indexes with China (2023)

Source: ASR Ltd. / UN Comtrade

Chart 6: Time Series of Export Similarity Indexes (DM)



Source: ASR Ltd. / UN Comtrade



Chart 7: Time Series of Export Similarity Indexes (EM)

Source: ASR Ltd. / UN Comtrade



Chart 8: Similarity with China's fastest growing export products

Source: ASR Ltd. / UN Comtrade





Source: ASR Ltd. / UN Comtrade

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