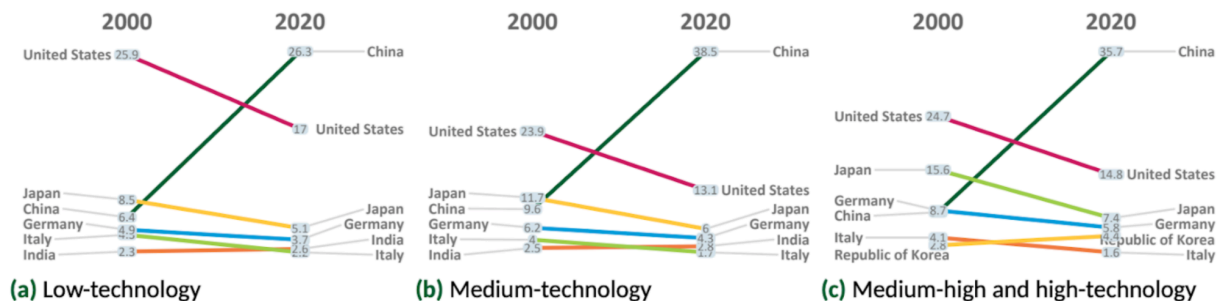


Why Global Trade Leads to China's Dominance?

– And the U.S. Strategy

In only three years, China has emerged as the [largest](#) auto exporter and will become the [largest](#) semiconductor exporter this year. Yet, it is the tip of the iceberg. To name a few, China produces 90% of the world's computers, 80% of solar equipment, 70% of drones, 70% of smartphones, 60% electric vehicles, and 50% commercial ships ... even the fruit [apple](#) at 54%—and importantly, with their supply chain components. According to the United Nations, China now manufactures nearly 40% of global output in value added, particularly in medium-high technology, far exceeding its global consumption share.



Shares in Global Production (Source: UNIDO)

This dominant position carries significant implications for the world economy and politics. For China, it means prosperity, the competitiveness of its authoritarian model, emboldened geopolitical ambitions, and enhanced technological, industrial, and military capabilities. For others—whether wealthier or poorer—it signifies the deprivation of development opportunities, deindustrialization, and risky dependency.

While this trend is unlikely to reverse anytime soon, questions remain: How has China gained dominance from being poor just 20 years ago? Will the dominance continue? Why do Chinese firms seem to easily crush the global market while Western firms don't build things like they used to? Can America compete when Chinese scientists and blue-collar workers of similar productivity and creativity receive far lower wages?

This article answers the questions through the lens of global trade logic. The analysis builds on the fact that post-1990 global trade (coinciding with China's rise)—based on the global value chain—fundamentally altered the nature of trade and the ways nations industrialize or de-industrialize. China's unique characteristics grant it “structural competitive advantage” that enables it to agglomerate global production via trade.

The fact is, with only a 20-30% final cost advantage, China wipes out industries of others along the supply chain, leaving trading partners struggling. Unlike the Cold War days, when the absence of free trade between two superpowers insulated their economies from each other,

today's trade relations between the United States and China have shifted from “market access for engagement” to “continued deindustrialization” and, ultimately, a “strategic mistake.”

Global Trade Before the 1990s

Let's first see an analogy. In the domestic market, if a large firm maintains low prices through efficiency or pricing strategies while producing on a massive scale, it drives competitors out. The global market operates similarly, though with even greater consequences, as there is no global government to redistribute gains from the winners.

The conventional concept of free trade as advocated by Adam Smith and David Ricardo was quite different from what we see today. Their theories were rooted in an idealized, optimistic view of mutual exchange based on nations' comparative advantages. The core idea was that countries could achieve "mutual benefits" through the division of labor and specialization. For example, wealthy nations export capital-intensive products, while poorer nations would export labor-intensive goods, each relying on its own production facilities.

What's New about Post-1990 Global Trade?

As economists have [observed](#), today's trade is greatly different, driven by the global value chain orchestrated by multinational firms (also referred to as the “[new new trade theory](#)”)—thanks to the revolution of information technology emerged in the 1980/90s. For example, multinational firms now [conduct](#) 80% of U.S. trade. The concept comparative advantage is found to have limits—[studies](#) show that about 90% of industries are more about direct competition rather than national comparative advantage.

Two game-changing outcomes have emerged from this shift:

First, the production chain can now be disaggregated across national borders, leveraging cost-effectiveness worldwide. The global value chain, which represents the most competitive way of production in a given sector, has nullified previous national efforts to industrialize, such as “import substitution” strategies pursued by countries like India and Brazil. Nations thus started to embrace “economic liberalization,” as traditional development approaches have proven uncompetitive in a global economy.

Second, the rapid transfer of know-how inside the global value chain has blurred the lines of national comparative advantage. By integrating into the global value chain, poorer countries now can export advanced products, gain competitive advantages, and expand their presence along the chain, especially when the rest of their economy remains underdeveloped (which helps lower costs). This, of course, contradicts traditional trade theories.

This logic applies perfectly to the rise of China. To be sure, modern trade theories, such as those proposed by Krugman (1979), Eaton and Kortum (2002), and Melitz (2003), exactly reveal this

logic by demonstrating that technology (know-how) and absolute cost are the key determinants of export patterns. Worth mentioning is that trade theories suggest that while imports realize welfare gains, exports are where the majority of trade gains in productivity and innovation come from.

The story went exactly like this. Before 1990, as many others, China attempted to develop indigenous industries through high tariffs and subsidies—televisions, tractors, and jets. These efforts unsurprisingly lagged in technology and efficiency compared to the most productive global practices of the time. Due to trade restrictions, its products also lacked the market. When the doors opened later, these industries were immediately found outdated.

After 1990, when China was effectively integrated into the world trade system, it was able to access the global, especially the Western markets. But more importantly, it successfully capitalized on the global value chain's search for lower costs worldwide. By joining the global value chain, China finally gained access to crucial productive know-how and began exporting more advanced products such as electronics. In 2005, foreign firms [accounted](#) for 60% of Chinese exports. A similar trajectory can be observed in today's Vietnam.

“Structural Competitive Advantage”

China's ascent in the global value chain has unfolded in three stages: assembly, expansion, and replacing multinational firms by national giants (on-going). Importantly, China's appeal to the global value chain extends beyond just labor cost or location—there are many poorer and geographically closer countries. Neither is it only the government's effort—it is millions of firms playing by the market rules that do the “real job.” But what has made them successful is a combination of unique country-specific, structural characteristics that together constitute what may be termed as “structural competitive advantage.”

These characteristics include institutional capacity that makes China easier to: Disregard labor and environmental standards, manipulate currency and trade barriers that bypass norms and agreements, sign favorable deals with multinational corporations, and implement industrial policies that divert resources from consumption and welfare to industries, infrastructure, and human capital training. This is why some may attribute China's success to “smart” policies. Other contributing factors include capitalism akin to social Darwinism, a pro-business and production-addicted environment, a super large home market, a low-welfare “working” culture (e.g., [neijuan](#)), and people who are more willing to ensure hardships.

Size also plays a crucial role—it may not matter much if China is of Vietnam's size. In a globalized age when nobody else can monopolize the entire supply chain, China's tremendous labor pool, including the annual output of STEM graduates—seven times that of the United States—not only confers advantages in scale, but also allows China to dominate far more industries, than Japan or South Korea ever could (1/10 and 1/25 the size of China's population, respectively). Factoring in exchange rates, the costs of Chinese blue-collar workers, engineers, and scientists are around 1/8 to 1/2 of those in the United States.

This structural imbalance in cost raises a key question: When technology converges, how likely can American firms outcompete Chinese counterparts on the same global stage, if scientists and engineers of similar levels in both countries receive vastly different wages? The “structural competitive advantage” is further bolstered by the fact that as China starts producing technology-intensive goods, costs in other sectors of its vast economy—such as logistics, construction, and services—remain much lower, driving down overall costs.

The exchange rate is another critical factor. China’s “structural competitive advantage” would diminish if the exchange rate rebalances trade as expected by theories. Most trade models assume balanced trade in which exchange rates adjust relative prices across countries—otherwise, “Britain can produce both wine and cloth cheaper than Portugal,” to cite the classic textbook example. Despite China’s tremendous, growing trade surpluses, the nominal value of the yuan has remained relatively unchanged for over a decade. Increasing surplus indicates structural imbalance in trade and the [agglomerating](#) of global production which is linked to “overcapacity.”

In sum, China’s “structural competitive advantage” in the age of the global value chain operates in ways that fail to follow the assumptions of traditional free trade theories (e.g., conventional comparative advantage, exchange rate adjustment, balanced trade, etc.). This advantage explains why China can worry Indonesia—a country with less than half of its average income—in [textiles](#), and make it difficult for American firms to compete in electric vehicles, even with subsidies. Overall and progressively, this advantage enabled China to move from assembly to upstream supply and R&D activities, and ultimately, to surpass and replace multinational firms.

Illustrative Cases

Bottom-up Strategy: One of China’s key strategies is exactly “replicating supply chains through leading multinational firms.” The Chinese government strategically offered attractive incentives to multinational firms like Apple and Tesla, which in turn [attracted](#) thousands more along their supply chains—also driven by “structural competitive advantage.” Today, 87% of Apple’s [suppliers](#) produce in China, and a small county like Taicang hosts over 500 German firms. Through the spillover of know-how and the advantage in localized optimization, local suppliers quickly [replaced](#) foreign firms. Acquiring the know-how involved forced technology transfers, joint ventures, acquisitions, talent poaching, or overseas cooperation.

The truth is, Chinese EV firms had struggled for over a decade before they gained access to the world-class EV supply chain that Tesla in 2018 brought in, four years after Tesla made its [patents](#) public. Within just two years, over 50 Chinese EV brands had emerged, seeing a boom in EV exports. Interestingly, Chinese auto giant BYD began releasing popular, stylish cars shortly after hiring designers from Audi. Unlike Audi or GM, Chinese workers do not have labor unions or other comparable rights. The same Tesla models produced in Shanghai are over 30% [cheaper](#) than those manufactured in Texas or Berlin.

Top-down Strategy: Another typical strategy of China is the use of state-supported firms to build large-scale, often strategic system-integration products, such as bullet trains, nuclear reactors, shipbuilding, and commercial aircraft. These projects initially relied on foreign components and supply chain know-how, yet with rapid absorption and localization, driven by, again, China's "structural competitive advantage." For example, the [Hualong One](#) nuclear reactor is now 90% localized from only a single digit a decade ago.

Once China successfully cultivates the entire ecosystem for a sector, it goes out to crush foreign competitors through trade. For example, China now owns over 50% of global commercial shipbuilding. Thus, Chinese firms rapidly capture sector after sector: telecommunications, electronics, machinery, automobiles, shipbuilding, materials, and now green energy, robotics, artificial intelligence, aircraft, biotechnology, and pharmaceuticals—all along their respective supply chains. According to the recent data, China already leads in most strategic [industries](#) and [technologies](#), with the trend more astonishing.

It must be recognized that, rather than pure government subsidies, this is a result of market forces that drive Chinese firms. Similar stories are unfolding in non-manufacturing sectors as well—once China has the capabilities to gain know-how. For instance, when immunotherapy cancer drugs and large language models like ChatGPT first appeared, Chinese firms quickly developed comparable products, often utilizing top-tier talents trained in or acquired from Western institutions. The pattern can also be observed in the recent development in China's movie and gaming industries.

Of course, there remains a shrinking list of sectors where China hasn't fully mastered the necessary know-how, and its structural advantage hasn't yet fully materialized. Advanced semiconductors are one of these sectors. However, as China is determined to direct tremendous resources into this sector, we will soon expect a new wave of Chinese high-end chips flooding the global market.

A Virtuous Cycle

Demand creates incentives. A competitive price achieved through “structural competitive advantage” given similar quality indicates global market prospects and profits, which incentivize firms to produce, invest, and innovate. The incentives include acquiring know-how by any means (even illicit ones). This is why Chinese EV firms, once catching up in know-how, roll out new features much more actively, why China [leads](#) the West in adopting industrial automation (accounting for [52%](#) globally in 2022), and why even German firms are [pouring](#) extensive R&D resources into China.

With success in exports, Chinese firms and the state reap significant revenue, as well as a booming economy, which translate into more spending on R&D, human capital, infrastructure, and industrial policies, further strengthening China’s advantage. Furthermore, the Chinese government pushes for more domination with national projects like Made-in-China 2025, “specialized and emerging technological giants cultivation” (teijingzhuanxin, 特精专新), and the “monopolization and securitization of supply chains” (qianglianbulian, 强链补链)—only aimed at strengthening the supply chain monopoly.

As the supply chains for manufactured goods agglomerate in China, they create a formidable cluster advantage. The agglomeration enhances Chinese firms’ abilities of supply chain integration and massive production for new products. China now spends a similar, rising amount to America on [R&D](#) and is leading in [innovation](#). For instance, [two-thirds](#) of the world’s patents for robots are held by Chinese firms. Even with increasing labor costs, supply chain cluster advantage makes production harder to relocate to cheaper places.

Once China’s supply chain advantage is formed, foreign firms help to strengthen it. For example, Uber and Chinese EV giant BYD have just [announced](#) a strategic partnership to integrate 100,000 new BYD electric vehicles into Uber’s platform, primarily because of BYD’s advantage. Foreign firms and consumers who increasingly depend on Chinese supply chains consolidate this monopoly status.

One may argue that firm-level excellence and product quality are also important. But they can be shaped and enhanced by a competitive form of capitalism where Chinese firms compete aggressively for market shares, without much concern for labor, social responsibility, and environmental matters. Learning-by-doing accumulates know-how on making products better: Indeed, Chinese products are increasingly associated with great ideas and quality.

The “Not So Good” U.S. Strategies

To use a popular Chinese netizens’ slang, is “my move leaves others with no way to go (走自己的路让别人无路可走).” Unlike Japan or Korea, China seeks to keep all valuable and strategic industries within the borders—the textbook mercantilism which China associates with its own regime security. China’s goal, as [officially](#) pronounced, is to “possess the full list of industries,

covering up-, mid-, and downstream supply chains, forming a cluster advantage unbeatable.” This zero-sum philosophy runs against all free trade theories.

China’s industrial dominance undoubtedly paints a grim outlook for the U.S.-China competition and the democracy-led world order. Economist Paul Krugman has [criticized](#) that instead of raising domestic consumption, Xi Jinping continues to rely on over-production and foreign demand. This is not just “beggar-thy-neighbor,” but effectively wiping out others’ industrialization. Free trade, once based on labor division, thus becomes “zero-sum,” or perhaps even economic [wars](#).

Given China’s “structural competitive advantage” and stubborn mercantilist philosophy, the hope for fair competition is futile, as market forces will only push domination to continue. The openness of democracies therefore becomes a disadvantage in such a competition (also consider TikTok and Temu which pose risks yet are less effective to cope with).

At present, U.S. policymakers have recognized this pressing issue and have tried several strategies: Worker-centric trade policy, industrial policies, tariffs, and the Indo-Pacific Economic Framework (IPEF). Unfortunately, these strategies don’t address the root cause and may not achieve even the basic goal—protecting U.S. industries and workers, let alone reversing the trend, outcompeting China, and strengthening the postwar democracy-led international order.

Worker-centric trade policy: Since global trade has significant distributional effects that harm workers, the United States withdraws from the TPP and focuses on bringing back jobs. However, the root cause extends beyond redistribution and, among other higher issues, involves the continued erosion of the industrial core, including in sectors where the U.S. has traditionally held an advantage, such as aircraft and pharmaceuticals.

Industrial policies & tariffs: Policies such as the CHIPS Act aim to boost a few key industries through subsidies, while ignoring the global landscape and pushing China toward more mercantilism. Not only may the U.S. find subsidies unsustainable when China doubles down on its own one (partly using external surplus), but this approach overlooks a wider range of important sectors where China is dominating (e.g., transportation, electronics, and robotics). Although tariffs may block some imports, China can simply move the assembly part to Vietnam while retaining control over the supply chain.

The Indo-Pacific Economic Framework: The framework aims to enhance supply chain resilience, but it doesn’t touch the core—market access, which is crucial as firms still choose production locations primarily based on cost calculation. This means China can still exploit its advantage and use exports to displace the industries of other countries.

Small yard, high fence: This strategy focuses on know-how by restricting key technology exports. However, China retains access to overseas talents and technologies (and increasingly indigenous ones) which are key to its state-supported projects. For example, 25% of Stanford computer science PhD students and the majority of the Meta AI team are Chinese nationals.

China has also been poaching scientists from Taiwan's TSMC for years. Moreover, the global market still incentivizes Chinese firms and restricting the supply can give away more market to Chinese emerging firms. After a year or two since the policy started, Huawei is set to [challenge](#) Nvidia with its new chips.

Attracting Chinese factories: Although this may help job creation, China's advantage is not confined to manufacturing alone, which occupies the lowest value-added position of the value chain (a.k.a. the "smile curve"), but extends into the upstream and downstream parts: R&D, marketing, services, etc. Host countries may soon find Chinese brands outperform local competitors, similar to how Japanese cars dominated in the 1990s or General Electronics eventually acquired by China's Haier. This could also further integrate host economies into the Chinese economy, granting China more leverage.

The Right Strategy?

Thus, the United States must have a holistic strategy for it to work, which requires understanding the root causes: new global trade dynamics based on the global value chain, trade assumptions that are not met (e.g., exchange rates adjustment and no market distortion), a dysfunctional WTO that [fails](#) to address mercantilism, and global market access that facilitates China's "structural competitive advantage" to absorb more sectors.

Among those is market access that plays the gateway role. Market access is like a swing: On one side, it facilitates China's structural advantage to agglomerate the global value chain, spurring growth in production and innovation; on the other side, it leads to [reduced](#) employment and innovation in others.

The U.S. government also must aim higher by avoiding a narrow and isolated mindset, as the problem is global and China is competing for global leadership and the competitiveness of its model: History and [theory](#) suggest that only by strengthening democracies economically can the United States achieve its prosperity and security goals.

After WWII, the United States and allies built the postwar liberal order, which includes the GATT/WTO, for supporting a prosperous, peaceful, and democratic world vision. Yet, the trade system is now being used to deindustrialize and destabilize democracies while strengthening authoritarian regimes worldwide: For instance, the largest trade surplus countries in 2022 were China, Russia, and Saudi Arabia.

Close Trade Loopholes: This means market access, which was key in past WTO negotiations—whether direct or indirect through third-country. Although it may be unrealistic to overhaul the WTO due to the collective action problem, as a first step, the United States can leverage existing frameworks such as IPEF or CPTTP to gather countries with similar concerns toward an adapted, modern trade system. Due to a profound gap in trust, the world may inevitably see two parallel technology systems and two markets emerge. This time, unlike the

WTO which failed to incorporate normative elements—partly why today’s problems occur—the conditions for market access should include one crucial measure: good governance.

The Know-how Side: As the U.S. still has leadership in a few sectors, including academia, new laws that more strictly regulate the behavior of multinational firms and employees are required, preferably working with global allies. Additionally, while discrimination should be called out, as a continuous talent-training and knowledge-transfer venue, the top 30 U.S. STEM PhD programs should get more attention, especially in emerging and national security-related areas. These programs are disproportionately represented by Chinese students, which is also unfair. On the other hand, many of China’s emerging sectors have been led by individuals who either returned to China or maintain academic or industrial connections.

Due to China’s “structural competitive advantage” that forms market forces to make domination possible in the global market, the current trade system will continue to bleed the country dry if left unchecked. Unlike the West, which often reacts to challenges as they arise, the philosophy of the Chinese government is to “nip risks in the bud.” Nonetheless, the time to make structural changes is now—before it’s too late to safeguard the future and restore equity in global development.

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