

High-Tech Industrialization of the Chinese Manufacturing Industry & the Future Direction of the US-China Cold War

By Shin Chang



Author Shin Chang

Foreword

Since the inauguration of the administration of President Joe Biden in the United States, the new US-China “cold war” has been intensifying. While under the previous administration of President Donald Trump the focus was on trade, Biden has taken over the economic war and is also beginning to develop a political war over leadership of the international community. However, according to publicly available information from the Chinese side, Chinese GDP rose by 9.8% year-on-year for the period January-September 2021, and despite a slowdown in the third quarter, full annual growth of more than 6% is expected. To note, Chinese exports to the US in the first three quarters of the same year rose by 32.9% to US\$411.54 billion, and exports to the US for the full year are expected to be a record-high by exceeding \$500 billion.

Furthermore, according to public data from the IMF, China’s real GDP growth rate for 2021 is 8.0%, exceeding the world average (5.9%), the US (6.0%), the euro-zone (5.0%), and Japan (2.4%). This also reflects the growth potential and resilience of the Chinese economy, and it is not too much to say that sanctions against China since the Trump era have had no economic impact. There are various reasons for this but the main causes are largely due to the US manufacturing industry going fables and the Chinese manufacturing industry increasing in size and going high-tech. Thus, this article will examine the outlook for the US-China cold war from the perspective of the mutual interdependent relationship of the industrial structure of the US and China, and China’s new economic development strategy.

US Companies Going Fables & Supply Chain Dependence on China

One of the factors behind the ineffective US sanctions against China is the progress of US businesses going fables. Fables corporations are manufacturing companies who do not have manufacturing divisions and specialize in product planning, development, and marketing while entrusting the manufacturing process to business partners. The US, since the 1980s, saw a rise in the number of fables corporations under the thinking that research and development, product planning, and marketing are the keys to creating added value. Build-to-order production by these fables corporations was initially introduced in the electronics industry, such as semiconductors and mobile phones in Taiwan, but was later transferred to China and expanded to a wide range of industries such as general machinery, interior, apparel, and beverages. Hence,

although fables corporations are businesses in developed nations such as the US, the majority of their suppliers are Chinese corporations.

Typical fables corporations include Apple, Qualcomm and Nike of the US, and Keyence, Nintendo, Uniqlo and Muji of Japan, but according to the 2020 supplier list for Apple in the US, of the 200 corporations China (including Hong Kong) ranked number one with 51 companies, followed by Taiwan with 48, Japan with 34, and the US with 32. “Chinese corporations are increasing their presence mainly in areas such as manufacturing of modules (composite parts) and metal processing where production is prone to economies of scale” (*The Nikkei*, June 3, 2021).

Fables corporations have advantages such as reduced capital investment, cost reduction through economies of scale, the ability to focus management resources on research and development, and the ability to respond to market changes with flexibility, and the US is seeing an accelerated pace in the manufacturing industry going fables. When the numerous small and medium-sized fables enterprises choose their suppliers, they tend to consider prioritizing cost over geopolitical risks.

Chinese corporations are technologically inferior to their counterparts in developed nations but they are at a clear cost advantage, which makes them the perfect suppliers to US fables corporations and they are obtaining a number of orders. In other words, in the supply chain, with the US and Chinese businesses each specializing in their respective fields of advantage, a sophisticated and efficient international division of labor is formed, and the interdependence of the US and China is deepening.

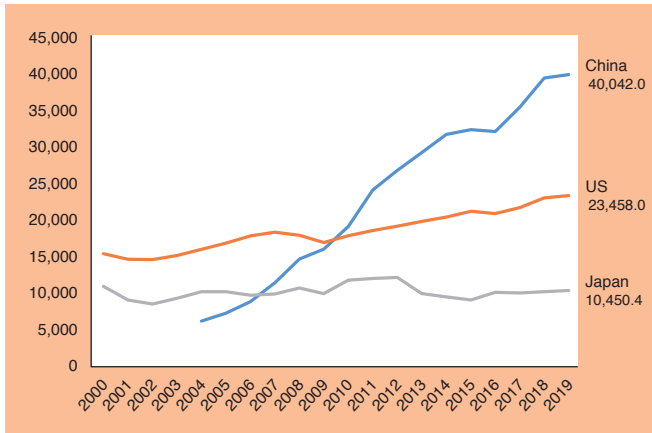
Of course, some suppliers (sewing and assembly industries) are starting to move from China to Vietnam, for example, where labor costs are cheaper. But in looking at the manufacturing technology, supporting industries and the development of the distribution system, this is difficult for many industries, and thus it is not too much to say that a decoupling of the US-China supply chain in the short-term is impossible.

Chemical & High-Tech Industrialization of China’s Manufacturing Industry

In order to forecast the future of the US-China cold war, China’s industrial development is an indispensable perspective. First is the progress of heavy and chemical industrialization of China’s manufacturing industry. During the 1980s and 1990s, China basically focused on textiles, apparel and food, but with the redevelopment of the northeastern region of China since 2000 becoming a trigger,

CHART 1

Comparison of value added of manufacturing industries in China, the US & Japan (US\$1 million)



Source: Compiled by the author with data from UN Statistics

adjustment policies for industrial structure expanded from China's northeast to the coastal area, the central area and the western area, and this has resulted in heavy and chemical industrialization and digitalization, and thus the growth of the manufacturing industry. As shown in [Chart 1](#), while the value added for the US manufacturing industry increased by 1.5 times for the period between 2004 and 2019, the value added for the Chinese manufacturing industry increased by 6.4 times, overtaking the US in 2009 to become the world's largest manufacturing power.

Core industries in China today include computers, communication equipment and electronic machinery, automobiles, electronic equipment, steel, chemical products, general machinery, and metal processing. The US most recently has been cooperating with India, Japan and Australia to compete with China, and has been expanding its Indo-Pacific strategy. However, the total value added for the manufacturing industries of the four countries combined falls short of that of China.

China's manufacturing industry has not only been expanding quantitatively, but the "quality" which reflects its technological standard is also building up. In 2006, China set up its "National Mid to Long-term Scientific Technology Development Program", and for the first time proposed constructing an "Innovation Nation". Since then, China has been actively working to introduce laws and systems related to scientific research, develop research entities such as universities, research institutions and businesses, promote transfer outcomes of scientific technologies, and develop an environment for an innovation market. As a result, China has overtaken the US to become the world's number one in research and development expenditure in the manufacturing industry. Hence, not only has the technological standard for the traditional manufacturing industry risen, but emerging industries which represent the next generation such as new energy cars (NEVs), on-vehicle batteries and renewable energy, have grown rapidly, and their competitiveness has also been strengthening.

According to *EV Sales* in the US, the production volume of completed NEVs for China's BYD (a major EV manufacturing

company) for the period January–October 2020 was third, after Tesla of the US and Volkswagen of Germany. According to *The Nikkei* (Oct. 5, 2021), China's NIO Inc. (a Chinese version of a fabless corporation), is about to overtake Tesla to become the world's number one.

Furthermore, in terms of production of on-vehicle batteries, the global share of Contemporary Amperex Technology Limited (CATL) for 2020 was 26%, making it the world number one, surpassing Panasonic which used to lead global production. CATL has also been selected as a major supplier to Tesla in the US, and therefore it is not too much to say that a decoupling of the US and Chinese economies is thought to be impossible in the short term.

In addition, in terms of production of solar panels, which is the focal point of the US-China trade conflict, China's global share for 2018 was 72.7%, far exceeding Europe's at 2.6%, the US at 1.3%, and Japan at 1.2%. Since solar panels are a key item in US sanctions against China, increases in tariffs have resulted in a sharp decline of Chinese exports to the US, but with China exhibiting its strong technological power and competitive advantage in costs, diversification in export destinations and sales expansion in domestic markets have resulted in powerful growth.

Competitive Advantage of the Chinese Manufacturing Industry

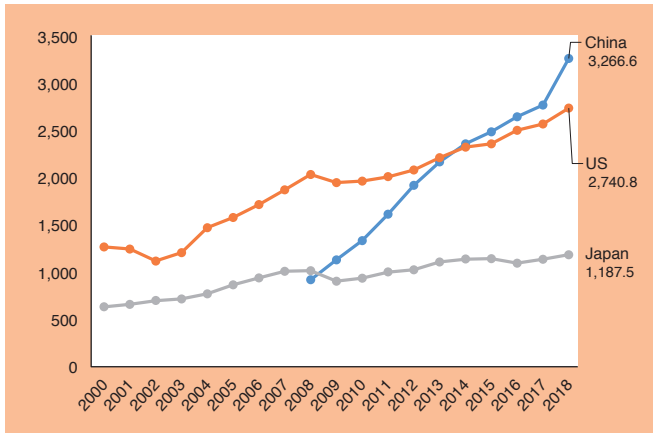
The competitive advantage for China's manufacturing industry is cost, but economies of scale, advantage in strong human resources, and advancement of research and development projects are thought to be behind these.

First, in terms of economies of scale, corporations of vast sizes have emerged on the back of a market with a population of 1.4 billion. In 2000, all of China's four major banks became the top four in the Top 10 World Banks – the Industrial and Commercial Bank of China, the Agricultural Bank of China, the China Construction Bank, and the Bank of China. In addition, the "Fortune Global 500 List of Companies (Sales)", which was released on Aug. 2, 2021, lists the number of Chinese companies that made the top 500 at 135 (including Hong Kong companies), exceeding 122 US companies to maintain the top position for the second consecutive year. To be more specific, annual sales of China's top company, the State Grid Corporation of China, are approximately 2.7 trillion yuan (¥46.9 trillion), and further, world class companies are emerging in many industries from traditional industries such as steel (Baowu Group) and railroad vehicles (China Railway Rolling Stock Corporation) to emerging industries such as electronic communication (such as Huawei), on-vehicle batteries (CATL), and renewable energy (Keelung), and these companies have become the main pillars supporting China's rapid economic growth.

Second is strong human resources and improvement in their "quality". With the rise in labor costs, China in recent years has been emphasizing improvement of the quality of its human resources. China today is not only utilizing human resources on a global scale through bringing in human resources from around the world and through overseas expansion of its businesses, but has also been engaging in human resource development projects by developing domestic education projects. In the past, China implemented the

CHART 2

Comparison of R&D expenditure in manufacturing industries in China, the US & Japan (US\$100 million)



Source: Compiled by the author with data from OECD

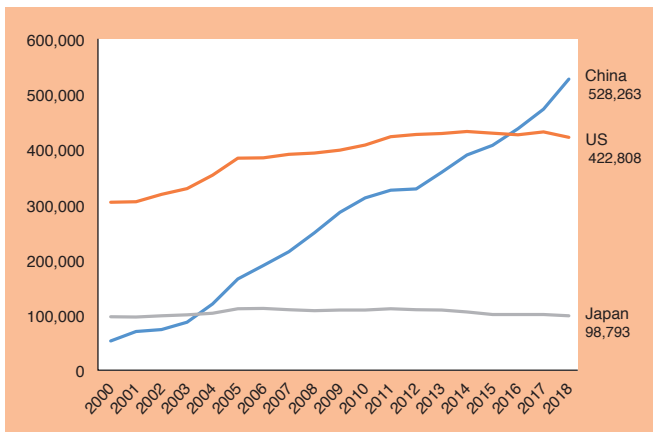
education policies of the “211 Project” (focusing on promoting 100 universities ahead of the 21st century), the “985 Project” (further designating priority development universities within the 211 Project), and the “Double First-Class Project” (prioritizing promotion of world-class departments and world-class universities) to empower the universities.

In today’s China, employment is expanding by approximately 10 million people every year, but of those, university graduates are 7.58 million, and those that graduated from graduate schools (Masters and Ph.D. included) are approximately 640,000. Since improvement in the depth and breadth of human resources is linked to improvement in labor productivity, China is shifting from a population power to a human resource power, and from enjoying a population bonus to a human resource bonus. Such human resource development has become a driving force in supporting China’s long-term economic growth.

Third is progress of research and development undertakings. As

CHART 3

Comparison of number of scientific papers from China, the US & Japan



Source: Compiled by the author with data from National Science Foundation (NSF)

research and development spending increases and human resources improve, research and development in the Chinese manufacturing industry is also progressing. As shown in *Chart 2*, research and development spending in China exceeded that of the US in 2014 to become number one in the world.

Looking at the number of scientific research papers and the number of patents obtained as a result of research and development, China has already passed the US to become number one in the world, as shown in *Chart 3* and *Chart 4*.

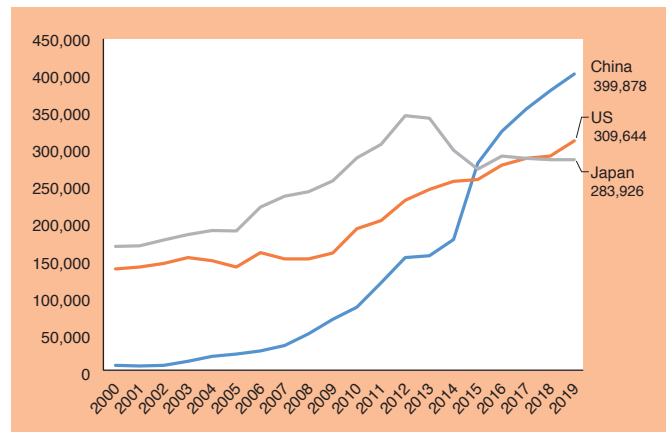
In particular, according to the 2021 edition of “Best 500 Chinese Companies”, research and development expenditure increased by approximately 21.5% to 1.31 trillion yuan (¥22.73 billion), and of that, Huawei which is a focal point of the China-US trade war was also number one in terms of research and development spending at 141.89 billion yuan (¥2.47 trillion), and the number of invention patents obtained was also number one (90,000 cases). This has resulted in bringing up the technological level of China as a whole, and is leading to export expansion of China’s industrial goods.

The technological level of China has been growing from traditional industries such as steel, machinery, shipbuilding, and railway vehicles, to emerging industries such as information communications, on-vehicle batteries, renewable energy and other high-tech industries, and China has significant competitive advantage in costs compared to Japan, the US and Europe. Since these industries have become sources of major export items especially to the US, it can be said that with the exception of the aerospace industry, a reversal of the manufacturing industries of the US and China may become a reality.

While the US has been eager to curb the development of Chinese industry through economic sanctions, due to an increase in labor costs in China some labor-intensive industries have indeed begun to move to Southeast Asia. But China has a vast domestic market, abundant capital and combined with strong human resources it still holds a competitive advantage, and as it further strengthens its industrial technology and growth potential, China’s economic growth is expected to not decline.

CHART 4

Comparison of number of patents obtained by China, the US & Japan



Source: Compiled by the author with data from World Intellectual Property Organization

Growth Strategy of Chinese Industry in the “Fourteenth Five-Year Plan”

The year 2021 marks the implementation year of the “Fourteenth Five-Year Plan and Outline of Long-Term Goals to 2035” (2021 to 2025, hereafter referred to as “Outline”). It raises various goals related to economic and social development and environmental protection, but the role that innovation and improvement in labor productivity plays in economic development requires particular attention, and the contents are as follows.

(1) Establishment of an independent scientific technology system. As tensions between the US and China intensify, establishment of an independent scientific technology system is key. “Outline” indicates China’s determination “to place independence and self-reliance of scientific technology as the country’s strategic pillar of development” and the policies to realize this. As measures to heighten China’s own research and development capabilities, important scientific technology projects were proposed in areas such as artificial intelligence (AI), quantum computers, semiconductors, life and health, brain science, biological breeding, space and aviation technology, and the underground and deep sea.

(2) In research and development of scientific technology, the State Key Laboratory will be central in utilizing strategic scientific technology to focus on promoting pure research, research and development in the emerging technology sector, and research and development for technologies that have become a bottleneck with US economic sanctions.

(3) In the field of industrial technology development, secure high-quality invention patents by focusing on developing (a) core basic components, (b) key basic materials, (c) advanced basic manufacturing process, and (d) industry-shared basic technology.

(4) Regarding the manufacturing industry and strategically emerging industries, the focus will be on fostering industries such as next-generation information technology, biotechnology, high-end apparatus, new materials and new energy vehicles.

(5) In order to promote innovation of corporations, focus on human resource development.

In other words, by improving labor productivity, China is aiming to shift its economic growth pattern from a traditional quantitative expansion to quality improvement. If this goal is achieved, China will become an economic power that will be equal to the US both in terms of economic scale as well as international competitiveness.

From Economic to Political War

A US-China bipolar system in international society is becoming more distinct. The two countries have a strong economic interdependent relationship, but the confrontation of ideology and political systems is intensifying. This is the essence of the US-China cold war.

The US once brought on the collapse of the former Soviet Union in the name of a free market economy, and the US today is trying to reenact that by obstructing China’s growing influence in the world by highlighting concepts such as American-style democracy and human rights, as well as issues regarding Hong Kong, Taiwan, and Xinjiang. China has been fiercely opposing this and is also cautious over the

“Quad” Summit between Japan, the US, Australia and India.

Despite having overwhelming economic and military power over China, the US faces three enemy states in Russia, Iran and North Korea, and given its failed war in Afghanistan, the US itself faces diverse challenges. It will require cooperation from China to resolve many challenges around the world, and thus a containment policy against China has its limitations.

Since the inauguration of the Biden administration, the US has been aiming to counter China by cooperating with its allies. The adoption of the joint statement by the G7 nations and the North Atlantic Treaty Organization (NATO) which made “opposing China” very clear can be seen as the US declaring a political war on China. But since the US and the European continent are not necessarily monolithic, it can be said that it is impossible to create a grand anti-China alliance. In particular, when Deputy Secretary of State Wendy Ruth Sherman visited Tianjin city, the Chinese submitted “two lists” and “three bottom lines” concerning Sino-US relations. Since then, the US has shown a more flexible attitude to seek common ground in bilateral relations such as releasing Meng Wanzhou, vice president of Huawei, requesting to re-convene Sino-US trade talks, and an online Summit between the leaders of the US and China by the year-end.

Conclusion

To summarize, while the US and China are in a deep interdependent relationship economically, there are major differences in ideology and political systems. The US, as the hegemonic state of the world, has presumed China to be its “virtual enemy” and has emphasized its competitive relationship, while on the other hand China, as the world’s number two economic power, stresses a cooperative relationship. It is expected that the US will continue to develop a compounded political conflict, including the economy, public opinion, and high tech, around its shift from a political war to an economic war, and has also set about a political offensive by raising the issues of democracy and human rights. It is also expected that this US-China cold war will be for the long term, but from the perspective of international relations theory that “an economically mutual interdependent relationship has the power to deter military conflict”, it is expected that it will not lead to a military conflict in the short term.

For China, economic growth, improvement in the livelihoods of its people, cooperation with the international community and escape from its dependence on the US are key policy challenges. While a recent shift in policy direction to “dual circulation” and “common prosperity” is part of that effort, the US has not only failed in its war with Afghanistan, but the “Return to Asia” policy under President Barack Obama and the “America First” under Trump have both failed. Considering the economic interdependent relationship between the US and China, Biden’s political war against China may follow in the same footsteps.

JS

Shin Chang is a professor at Fukui Prefectural University. He holds an M.A. in Japanese Economic Studies from Jilin University Graduate School, China, and has previously been professor and deputy director at Jilin’s Northeast Asian Studies College, and visiting professor at Kanazawa Seiryō University.