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CHINA MOVES UP THE VALUE CHAINS: FOXCONN'S DILEMMA

[The expected global technology supply chains] will be one for China and those associated with it, and another for the US and their friends.

- Liu Young-way, Chairman of Foxconn [1]

The year 2020 was exceptionally challenging, full of uncertainties for businesses around the world. As the largest electronics manufacturer in the world, Foxconn was no exception. Officially called Hon Hai Precision Industry, based in Taiwan, Foxconn was also one of the largest employers in the world, with a total income of USD172bn in 2019.[2]

In Q1 2020, Foxconn's profits fell to the lowest level in two decades, plunging 90% year-on-year, due to business closures amid the coronavirus pandemic and low demand by its key customers, including Apple.[3] Even though it recovered in Q2 2020, with a quarterly profit up 34% year-on-year,[4] Liu Young-way, Chairman of Foxconn, could not sit back.

China's role in the global value chains was changing, and the US-China trade war and the outbreak of COVID-19 were just catalysts for change. As a major supplier to Apple and other global technology giants, Foxconn had the ability to manufacture different parts in multiple locations on the basis of cost savings, while ensuring good quality and competitive prices, which made it indispensable in the global supply chains. In the long run, Liu had to consider Foxconn's strategic changes. How would the global value chains be reshaped? How should Foxconn strategically position its manufacturing facilities?

[1] Kathrin Hille, "China's share of global exports falls in supply chain rethink," *Financial Times*, 18 August 2020.
[2] Foxconn, 2019 Annual Report.
[3] Yimou Lee and Ben Blanchard, "Foxconn quarterly profit plummets, sees new growth from post-virus lifestyles," Reuters, 15 May 2020.
[4] Yimou Lee, "Apple supplier Foxconn's profit beats view, sees smartphone demand off lows," Reuters, 12 August 2020.

Dr. Minyi Huang prepared this case under the supervision of Professor Heiwai Tang for class discussion. This case is not intended to show effective or ineffective handling of decision or business processes. The authors might have disguised certain information to protect confidentiality. Cases are written in the past tense, this is not meant to imply that all practices, organizations, people, places or fact mentioned in the case no longer occur, exist or apply.

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Global Value Chains

Historical Background

Toward the end of World War II, nearly all countries wanted to avoid the beggar-thy-neighbor policies[5] that were commonly practiced before the war. They lowered their trade barriers to one another and established several multilateral organizations, including the IMF and the World Bank, in Bretton Woods in 1944, making efforts to create a postwar liberal international order[6] and peace. In the late 1980s, developing countries in Latin America started market-oriented reforms. In the early 1990s, many Southeast Asian and Latin American countries adopted liberal policies, and the world entered a period of so-called hyper-globalization. This globalization trend from 1990 to 2009 involved China and India, the two most populous countries, which helped lift billions out of poverty and narrow the income gap between developed and developing countries.

In the global value chains, raw materials and intermediate products were sourced and shipped across countries several times and then assembled in another location, and the completed product was re-exported to consumers worldwide. With the support of advanced information and communications technology (ICT), the global value chains allowed a division of labor across different locations. The combination of developed countries' know-how with developing countries' low-cost labor produced lower-priced and higher-quality final products, leading to shared gains from trade among the supply-chain-participating countries. Global sourcing lowered production costs and increased profits, which enabled more global sourcing activities and investment in technologies. [7]

North America and Europe were global value-chain hubs. In Asia, liberalizing economies formed the production network with a division of labor across countries, the so-called "Factory Asia." These countries benefited not only from specialization and economies of scale but also from the technology transfer and technology spillovers from firms in developed countries. In the early 2000s, international trade reached an all-time high in terms of breadth, depth, and growth rate.

The global value chains made the traditional "Made in" labels increasingly irrelevant, because many goods were "Made in the World." The two lines engraved in each iPhone and iPad were "Designed by Apple in California" and "Assembled in China," which only specified the start and the end of a long and sophisticated supply chain. In fact, the components of an Apple iPhone were produced in 43 countries, using advanced patented technologies and very sophisticated intermediate inputs.

Additionally, many activities in different locations took place at the same time. Toshiba in Japan, Samsung in South Korea, and Qualcomm in the US conducted R&D and manufactured different key parts and components for the iPhone, including microprocessors, sim cards, and display modules.

[5] A beggar-thy-neighbor policy is "a policy that seeks benefits for one country at the expense of others, or tries to cure an economic problem in one country by means which tend to worsen the problems of other countries." [Source: Oxford reference, "beggar-my-neighbour policy," Oxford University Press, https://www.oxfordreference.com/view/10.1093/oi/authority.20110803095455931, accessed 20 December 2020.

[6] The liberal international order refers to the international relationships led by the US and its allies after the WWII. These international relations were organized according to the principles of international cooperation through multilateral institutions, such as the UN and the WTO, including open markets, security cooperation, freedom, and democracy。

[7] Heiwai Tang, "Globalization in Crisis: Lessons from the Past Two Centuries with Some Thoughts on the Current Events," Asia Global Institute, the University of Hong Kong, September 2020.

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For each iPhone leaving a Foxconn factory in China and shipped to the US, US Customs recorded a USD500 trade deficit with China, but much of this USD500 was not value-added from the assembler in China but from upstream suppliers in other countries, like Japan, South Korea, and the US.[8] The percentage of the electronics exports from China that were considered as value-added attributed to Chinese entities was only 53% in 2007.[9]

China in the Global Value Chains

China played an important role in the global value chains as a source of raw materials such as rare earth elements, a manufacturer of many intermediate inputs, a major processor and assembler of components and finished products, a major consumer marketplace, and a large consumer of commodities and industrial products.

The Chinese government started cutting import tariffs and foreign direct investment (FDI) restrictions and offering favorable trade policies and tax incentives when China prepared to join the WTO in the mid-1990s. This led to a massive FDI flow into China to outsource labor-intensive tasks. China joined the WTO in December 2001. China's medium tariff rate dropped from 25% to 7.5%, and the percentage of industries that required import licenses dropped from over 15% to 1.2% between 1995 and 2007.[10] Thanks to its economic reforms and trade and FDI liberalization, China, as a late-comer to "Factory Asia," had gained a double-digit percentage income growth along with poverty reduction between the mid-1990s and the mid-2000s.[11] Despite the negative impact of the US-China trade war, China exported 1,200 products, accounting for 22% of the total global exports in 2019, lower than 25% in 2018. In terms of consumer goods, China's global market share was 42% in 2019, down from 46% in 2018.[12]

In 2015, the Chinese government announced its national strategic plan Made in China 2025 (MIC 2025). This plan encouraged the development of high-value, high-tech products and services. It was clear that China wanted to move away from producing low-priced, low-tech goods, which was enabled by low labor costs and supply chain advantages. This move was supported by government-guided funding and government policies (such as financial policies, market access restrictions, and government procurement strategies).[13] Many countries considered the plan a threat. For example, the US considered MIC 2025 as a "real existential threat to U.S. technological leadership."[14] The Trump administration imposed tariffs targeting mainly manufactured goods included in MIC 2025. It also investigated and blacklisted those leading high-tech Chinese companies participating in the MIC 2025 plan based on concerns about technological theft and national security.

China was moving up the value chains while gradually reducing reliance on foreign parts and components. China's technology value chains were highly integrated with the rest of the world. Research that studied 81 technologies in 11 areas found that China had more than 90% technologies that followed international standards.[15] Chinese companies grew rapidly, but some key components, including reduction gears and power electronics, had to rely on foreign suppliers.

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[8] Ibid.

[9] Hiau Looi Kee and Heiwai Tang, "Domestic value added in exports: theory and firm evidence from China," *American Economic Review* 106, no. 6 (2016): 1402–1436.

[10] L. Brandt, J. Van Biesebroeck, L. Wang, and Y. Zhang, "WTO accession and performance of Chinese manufacturing firms," *American Economic Review* 107, no. 9 (2017): 2784–2820.

[11] Heiwai Tang, "Globalization in Crisis.".

[12] Kathrin Hille, "China's share of global exports falls in supply chain rethink."

[13] Reggie Lai and Lingling Deng, "China's industrial policy and its implications for foreign manufacturers," America Chamber of Commerce Shanghai, 9 November 2017, www.amcham-shanghai.org, accessed 21 December 2020.

[14] Lorand Laskai, "Why does everyone hate Made in China 2025?," Council on Foreign Relations, 28 March 2018.

[15] McKinsey Global Institute, *China and the world: Inside the dynamics of a changing relationship*, July 2019.

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> *Globalization is facing a reversal, with rising protectionism and unilateralism. The world economy is weakening as international trade and investment, science, technology . . . security and politics are all undergoing profound change. We are forming a new development pattern with the domestic economic cycle playing a leading role. Our economy is at a critical period of transformation.*
>
> - Xi Jinping, General Secretary of the Chinese Communist Party [16]

In May 2020, to cope with the US-China trade war and the coronavirus pandemic, the Chinese government announced a "dual circulation" policy. Dual circulation referred to internal and external circles of economic activities. It aimed to reduce the country's reliance on foreign markets and technologies and to facilitate domestic consumption and technological advancement.

Challenges to the Global Value Chains

In the 2010s, the consumption patterns around the world shifted from tradable goods to less tradable services [17] because of aging populations in developed countries and the growing affluent middle-class in emerging economies, including China and India.

The number of global trade transactions was further reduced because the benefits of joining global supply chains were limited and could diminish over time. With the access to advanced technologies, developing countries would learn to manufacture an increasing number of parts and components that they had previously depended on importing from developed countries. At the same time, the costs of production in developing countries would increase, and diminishing returns would discourage companies in developed countries from leveraging the global value chains.[18]

Moreover, with technology advancement, manufacturers no longer regarded the availability of cheap labor as the most important consideration. Other considerations like energy and logistics costs gained more importance in terms of the total cost of production. Many advanced manufacturing technologies aimed to reduce labor costs from manufacturing processes. As a result, the abilities to reduce time to market and to quickly respond to customer needs were important to companies' regional sourcing and production decisions. [19]

As a result of the changes in global manufacturing production, political and economic power experienced a structural change domestically and internationally. Domestically, income and wealth inequality reached unprecedented levels in many countries, which caused the resurgence of populism and antiglobalization sentiments.[20] Similarly, while China significantly increased in its share of global manufacturing output, the share of G7 countries declined from 70% in 1970 to 50% in 2010.[21]

Global supply chains also increased interdependence between companies and countries. Any natural disaster, infectious disease, and wars could raise macroeconomic uncertainties across

[16] Lily Luo, "China becomes first major economy to recover from COVID-19 pandemic," *The Guardian,* 19 October 2020.
[17] L. Lewis, R. Monarch, M. Sposi, and J. Zhang, "Structural change and global trade," Globalization and Monetary Policy Institute Working Paper 333, 2018.
[18] A. Borin and M. Mancini, "Measuring what matters in global value chains and value-added trade," Policy Research Working Paper No. 8804, Washington DC, World Bank Group.
[19] Justin Rose, Ian Colotla, and Michael McAdoo, "A manufacturing strategy built for trade instability," Boston Consulting Group, 13 February 2020.
[20] Heiwai Tang, "Globalization in Crisi."
[21] R. Baldwin, *The Great Convergence: Information Technology and the New Globalization* (Cambridge, MA: Harvard University Press, 2016).

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the global production network. Profound shocks like financial crisis, terrorism, extreme weather, and pandemics, along with trade disputes, higher tariffs, and broader geopolitical uncertainties increased the frequency and magnitude of supply chain shocks. Those supply chains that were heavily traded, including those highly valued ones like computers and electronics, were more exposed than those with low trade intensity.

The pressures on the global value chains could come from a global trade slowdown, partly caused by the sudden decline in global demand, financial crisis, and trade barriers. The breakout of the 2008 financial crisis led to a surge of unemployment in developed countries, resulting in anti-trade sentiment and protectionist policies. In the US, for instance, it took nearly a decade to stop the unemployment rate from rising and returning to the level of economic growth before the crisis. [22] Meanwhile, the financial crisis significantly reduced the amount of working capital available for production and the availability of trade credits required for long-distance trade. [23]

Electronic Manufacturing

The electronic industry, which included manufacturing, design and development, assembly, and maintenance services, was one of the fastest-growing and most innovative industries. As a fast-cycle industry, companies had to invest heavily in research and development to compete to be the first to market with new products. Many multinational companies, such as Apple and Dell, had developed a lean and agile global value chain with low inventory levels and just-in-time manufacturing.

Asia was the region that hosted the largest electronics industry cluster in the world, from manufacturing different electronic parts and components to assembling and testing finished products. The key enabler of this regional development was the WTO's Information Technology Agreement, which had waived IT-related products' import tariff among its members since 1996.

China housed more than half of the total electronics manufacturing capacity in the world. Apple's top 200 suppliers had 357 factories in China and 63 factories in the US. [24] Guangdong, for example, was an electronic manufacturing and technology hub with over 6,500 high-tech firms, accounting for one-fifth of the total manufacturing capacity in China. Companies could source anything they needed from Guangdong. The SEG Electronics Market in Shenzhen, Guangdong, was an example. It offered component parts, different types of equipment, and sophisticated devices such as electronic chips, circuit boards, small gadgets, hoverboards, and video cameras. These markets in Guangdong acted as sales links to the factories across China. With this integrated network of suppliers and manufacturing facilities, Guangdong developed an ecosystem serving companies of all sizes. Companies were able to prototype new technical designs, manufacture, and mass-produce any type of electronic device that their international and local clients wanted immediately. This ecosystem was also well supported by a wider network of service providers such as venture capital funds and law firms. Additionally, high-speed rail and highway made it easy to travel between Guangdong and other major cities in China.

In the view of Foxconn, market saturation and growth stagnation were two predicaments for the industry. [25] Hence, Foxconn wanted to focus on diversification in terms of application,

[22] Centre on Budget and Policy Priorities, *Chart book: Tracking the post-great recession economy*, 2020.
[23] N. Pavcnik, "The impact of trade on inequality in developing countries," National Bureau of Economic Research No. w23878, 2017.
[24] Melissa Cyrill, "Shifts in China's Industrial Supply Chain and the US-China Trade War," *China Briefing*, 24 January 2019.
[25] Foxconn, 2019 Annual Report.

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technology, and manufacturing process. For example, the company not only assembled components into final products but also manufactured components, developed software capabilities, and launched its own brand of mobile accessories. Foxconn wanted to explore new industries such as the automobile market and 5G, to strengthen research and development in new technologies and techniques, and to build more in-house manufacturing capabilities and increase automation.[26]

The consulting firm McKinsey suggested that more regular supply chain disruptions were a factor Foxconn also should consider, because supply chain disruptions that lasted one month or more were expected to happen every 3.7 years.[27]

Certain vulnerabilities were inherent in specific industries; for example, electronics manufacturers had to face relatively short product life cycles and meet holiday peak sales seasons. Other vulnerabilities were the results of companies' individual decisions that influenced supply chain resilience. These included the level of inventory, the complexity of product portfolio, the number of SKUs,[28] insurance coverage, and the amount of debt. A company's supplier networks could create vulnerability, such as the number of suppliers and the number of tiers of participating suppliers. If suppliers were concentrated in a single country or region due to their specialization and economies of scale, then a localized natural disaster or geopolitical conflict could cause problems for the entire network. Similarly, depending on a single major customer could cause issues when a demand shock caused the customer to significantly reduce the order.

Foxconn

Company Background

Headquartered in Taiwan, Foxconn was the largest component assembler in China. Foxconn was founded by Terry Gou in 1974; Young-way Liu took over as the Chairman in 2019. Foxconn grew from a leading OEM,[29] ODM,[30] and IDM[31] company to an Innovation Integration Design Manufacturer (IIDM) to provide customers with integrated services, including industrial design, technology innovation, as well as software and hardware integration.[32] Foxconn focused on computers, communications, and consumer electronics products. The key markets for Foxconn's products included China, the US, and Japan.

Foxconn's assembly factories produced for many leading electronics companies in the world, including Apple, Amazon, Intel, Sony, Huawei, and Xiaomi. Foxconn worked with the companies in Japan, the US, and European Union to form a global production network. The company was listed on the Taiwan Stock Exchange [see **EXHIBIT 1** for corporate financial performance].

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[26] Ibid.

[27] Adnan Seric, Holger Görg, Saskia Mösle, and Michael Windisch, "Managing COVID-19: How the pandemic disrupts global value chains," April 2020, Vienna, UNIDO.

[28] Stock Keeping Unit (SKU) is the product code specifying the product size, color, and style. It is an accounting term for inventory management that can be used to search, identify, and manage stock on hand.

[29] OEM (Original Equipment Manufacturer) is "a company whose goods are used as components in the products of another company, which sells the finished item to users". [Source: Investopedia, https://www.investopedia.com/terms/o/oem.asp, accessed 22 December 2020].

[30] ODM (Original Design Manufacturer) is "a company that designs and manufactures a product, as specified, that is eventually rebranded by another firm for sale." [Source: Wikipedia, https://en.wikipedia.org/wiki/Original_design_manufacturer, accessed 22 December 2020].

[31] IDM (Integrated Device Manufacturer) is "a semiconductor company which designs, manufacturers, and sells integrated circuit (IC) products." [Source: Wikipedia, https://en.wikipedia.org/wiki/Integrated_device_manufacturer, accessed 22 December 2020].

[32] Company website, https://www.foxconn.com/en-us/products-and-services, accessed 22 December 2020.

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Foxconn believed that using robots in manufacturing in order to save labor costs and maintain competitiveness were the future [see **EXHIBIT 2** for the changing number of workers in China]. In 2006, Foxconn independently developed its first robot, "Foxconn Shenzhen No. 1." By 2011, it had 10,000 robots, which increased to over 1 million by 2014. The use of robots was popular among Chinese manufacturers. A study of a factory in Dongguan, Guangdong, found that replacing 90% of human workers with robots led to a 250% rise in production and an 80% drop in defects.[33]

Manufacturing Facilities

In 2018, Foxconn had 35 facilities serving Apple in various countries, including China, India, Brazil, Vietnam, and the US. Twenty-nine were located in China.[34] As the largest iPhone contract assembler for Apple, Foxconn was estimated to handle 80% of the iPhone 12 orders. It took about 400 steps involving 94 production lines to assemble an iPhone.

Foxconn's main manufacturing facilities were located in Zhengzhou, Henan Province, and Shenzhen, Guangdong Province. In 2019, Foxconn made up more than 60% of Henan Province's smartphone exports. China accounted for 27% of global smartphone sales, one-quarter of which came from Henan.[35]

In Zhengzhou, Foxconn's facilities covered 2.2 square miles, operating as final assembly, testing, and packaging (FATP) for iPhone. Every day, around 500,000 iPhones were produced, boxed, wrapped, and palletized there, ready for shipment.[36] China had built a large customs facility a few hundred yards from the factory gate, which enabled Foxconn to sell iPhones to Apple and Apple to resell to the world. For those iPhones shipped to the China market, customs officials could electronically stamp the iPhones as "exports," restamp them as "imports," and collect 17% value-added tax based on the imported price at the same time. Then, the iPhones were shipped by truck to Apple's national distribution center in Shanghai and then distributed to different destinations in China. Shipping an iPhone from the Foxconn factory to Apple's Shanghai distribution center took about two days.[37] Those iPhones that were sold to other markets outside China were delivered by truck to the Zhengzhou Airport, three miles from the customs facility. Normally, it took three days for an iPhone to travel from the Foxconn factory in Zhengzhou to an Apple store in San Francisco in the US, a distance of about 6,300 miles.[38]

Foxconn's largest factory was located in Longhua Science and Technology Park, Shenzhen. Designed and built like a walled university campus, it was also known as "Foxconn City." The Park covered 3 square kilometers and included 15 factories, 4 swimming pools, a television network called Foxconn TV, a fire brigade, and dormitory buildings for workers. The Park also housed a grocery store, a bank, a bookstore, a hospital, and some restaurants. It had a population of around 300,000.[39]

In South America, Foxconn's facilities were all located in Brazil, including mobile phone manufacturing in Manaus and Indaiatuba and other production bases in Jundial, Sorocaba, and Santa Rita do Sapucai. In Europe, Foxconn was the second-largest exporter in the Czech Republic. Its factory in Turkey was close to Istanbul, inside the European Free Trade Zone.

[33] Mihai Andrei, "Chinese factory replaces 90% of human workers with robots. Production rises by 250%, defects drop by 80%," *ZME Science*, 3 February 2017, https://www.zmescience.com/other/economics/china-factory-robots-03022017/, accessed 11 October 2020.
[34] Shobhit Seth and Julie Young, "9 major companies tied to the Apple Supply Chain," Investopedia, 4 October 2020.
[35] Mark Gurman and Debby Wu, "Apple supply chain braces for disruption from coronavirus," Bloomberg, 28 January 2020.
[36] David Barboza, "An iPhone's journey, from the factory floor to the retail store," *New York Times*, 29 December 2016.
[37] Ibid.
[38] Ibid.
[39] Company website, http://www.foxconn.com.cn/ReportMedia25.html.

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Foxconn also had factories in Hungary and Slovakia. In Asia, Foxconn started producing iPhones in India in April 2019. Foxconn had two joint factories with Sharp Corporation to produce large-screen TVs in Osaka, Japan. Foxconn also owned seven factories in Malaysia, including four fully automated assembly lines, three semi-automated assembly lines, and two fully automated packaging lines. Foxconn also had a 4.9% shareholding in SK C&C, an IT service provider in South Korea.

In North America, Foxconn owned factories in Mexico through the acquisition of Motorola's mobile phone manufacturing base, a set-up box factory from Cisco System, and an LCD TV factory from Sony. In 2007, Foxconn signed an agreement with the state of Wisconsin, the US, as part of the Trump administration's strategy to bring manufacturing jobs back to the US. Foxconn said it would invest in a USD10bn factory and employ 3,000 workers initially, which would increase to 13,000 by 2022. In return, Foxconn would receive a subsidy worth over USD3bn, the largest the US government had ever given to a foreign company. But this agreement received sharp criticism, including criticism of the costs of creating jobs and the negative impact on the environment. According to Wisconsin's Legislative Fiscal Bureau, Wisconsin's investment in the Foxconn factory would not break even until 2043 in the best-case scenario.[40]

In October 2020, Foxconn was informed that it would not receive the first installment of USD3bn because it had not hired at least 520 full-time employees by the end of 2019. Foxconn was supposed to build a factory for Generation 10.5 LCD panels for TV screens, but the plan was later changed to build a Generation 6 facility manufacturing small screens for mobile phones and other wearable devices. This meant Foxconn would spend less to build the plant and require fewer workers after completion. [41] This did not come as a surprise. Though labeled as "the eighth wonder of the world" by President Trump, Foxconn's plans for the site changed several times over the years. In January 2019, Foxconn reevaluated its initial plans because of the high labor costs in the US. Instead of manufacturing workers, Foxconn hired mostly engineers and researchers in the US.[42] In April 2020, Foxconn suggested using the factory to manufacture ventilators to treat COVID-19 patients.[43]

Cost competitiveness in the US was something Foxconn had to consider. The US cost competitiveness had improved significantly against other manufacturing economies in Asia and Europe between 2000 and 2015. Though still among the top manufacturing economies, the US had lost competitiveness since 2015 because of the appreciation of the dollar against other major currencies, labor costs rising faster than manufacturing productivity growth, and a diminishing advantage on energy costs. [44]

Macro Environment

US-China Trade War

> *We've been working on it [reducing the reliance of our supply chains in China] over the last few years but we are now turbo-charging that initiative.*
>
> - Keith Krach, US Under Secretary of State for Economic Growth, Energy & the Environment [45]

[40] Jacob Kastrenakes, "Wisconsin won't break even on Foxconn plant deal for over two decades," *The Verge,* 10 August 2017.
[41] Timothy B. Lee, "Wisconsin blames Foxconn, says $3 billion factory deal is off," *Ars Technica,* 13 October 2020.
[42] Jess Macy Yu and Karl Plume, "Foxconn reconsidering plans to make LCD panels at Wisconsin plant," Reuters, 30 January 2019.
[43] Shelley K. Mesch, "Foxconn could make ventilators at Wisconsin plant," *Wisconsin State Journal*, 8 April 2020.
[44] Justin Rose, Ian Colotla, and Michael McAdoo, "A manufacturing strategy built for trade instability," Boston Consulting Group, 11 December 2018.
[45] Humeyra Pamuk and Andrea Shalal, "Trump administration pushing up to rip global supply chains from China," Reuters, 4 May 2020.

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In early 2018, US President Trump declared tariffs on solar panels, followed by steel and aluminum, signaling the start of the US-China trade. China was the market leader in the solar panel and steel industries and retaliated by imposing tariffs on USD3bn worth of US imports.

Regarding the electronic equipment, on 2 August 2018 the United States Trade Representative (USTR) announced the revision of tariffs from 10% to 25% on USD200bn worth of Chinese goods, including commercial electronic equipment and vehicle/automotive parts. Then, China retaliated with a tariff on USD75bn worth of US goods. On 1 August 2019, it was revealed that the tariff on the additional USD300bn worth of Chinese imports, including electronic consumer goods, would increase after 1 September 2019. A few days later, on 23 August, Trump tweeted, stating, "American companies are hereby ordered to immediately start looking for an alternative to China." As a result, the tariffs were imposed by the US exclusively on Chinese goods worth USD550bn, and the tariffs were imposed by China exclusively on US goods worth USD185bn.[46] [See **EXHIBIT 3** for the trade war timeline.]

The Trump administration stepped up the attacks on China before the US presidential election on 3 November 2020. In order to push companies to remove sourcing and manufacturing from China and move manufacturing back to the US, the US government used tax incentives and reshoring subsidies. Trump also repeatedly mentioned putting additional tariffs on top of the tariff of up to 25% on the Chinese goods worth USD370bn, which was part of the total of USD550bn already in place. Those US companies that paid the tariffs were under pressure, especially when sales plummeted during the COVID-19 lockdowns.

Impact on Foxconn

Foxconn recorded the lowest quarterly profit in two decades at the start of 2020, owing to business closures amid the coronavirus pandemic and low demand from its key customer, Apple. Thanks to its server and computing businesses, the company recorded a better-than-expected result in Q2. But its revenue from key consumer products, especially smartphones, dropped more than 15% compared to one year earlier.[47] [See **EXHIBIT 4** for sales of leading mobile brands.]

Impact on China's Electronic Manufacturing Industry

Huawei, one of Foxconn's customers, was at the center of the US-China trade war. After Trump declared a national emergency to protect American networks from foreign technologies, Huawei was banned from buying US technologies. Despite all the bans and problems, Huawei was the only company among the top-five global smartphone vendors with double-digit growth in smartphone sales in Q3 2019. Huawei was the second-largest smartphone company in the world after Samsung in terms of sales revenue. As a market leader in 5G technologies, Huawei placed an order of more than 50 million units of 5G smartphones for 2020.[48]

In 2020, Trump issued executive orders to ban US companies from trading with Chinese technology companies Tencent and ByteDance. This increased tensions between the US and China. Tencent owned WeChat, the leading messaging app in China, with 1.2 billion monthly active[49] users, and ByteDance owned the globally popular video-sharing app TikTok. The ban was enforced in mid-September, but the details were unclear. If Apple had to remove the WeChat app from its App Store, there would be a negative impact on iPhone's sales in China.

[46] Dorcas Wong and Alexander Chipman Koty, "The US-China Trade War: A Timeline," *China Briefing*, 25 August 2020.
[47] Saheli Roy Choudhury, "Apple supplier Foxconn is ahead of its peers in diversifying out of China, analyst says," CNBC, 13 August 2020.
[48] Airyl Jaszly, "Foxconn reportedly receives order for over 50 million Huawei 5G smartphones," 2 December 2019, www.gizmochina.com, accessed 23 October 2020.
[49] CIW Team, "WeChat statistical highlights 2020; mini program DAU > 300m," 18 May 2020, https://www.chinainternetwatch.com/30201/wechat-stats-2019/, accessed 21 December 2020.

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Liu was not worried that a reduction in demand for Apple phones in China would lead to revenue loss for Foxconn because consumers might purchase smartphones from Huawei, Xiaomi, or Oppo instead, all of which were also Foxconn's customers. Some iPhone fans would still buy iPhones, while looking for other ways to access the WeChat app. [50]

Though the US was still China's export destination on an individual country basis, the European Union replaced North America as the top trading partner in 2019. In 2020, China's top export destination was expected to be the combined Association of Southeast Asian Nations (ASEAN).

COVID-19

COVID-19 started spreading from Wuhan, Hubei Province, in December 2019. The Chinese authorities imposed severe restrictions on traveling and initiated curfews and quarantines across the country in January 2020. As a result, the economy slowed, and many production sites closed.

China was the first country to go through the epidemic cycle. When COVID-19 began, Foxconn's factories in China had to be kept closed for a longer period than the traditional Chinese New Year holidays.[51] While the government's measures, such as economic lockdown and travel restrictions, had successfully kept the coronavirus under control in China, they also made it very difficult for workers to travel and return to the factories from their hometowns in remote areas.

The second shock came from the drop in customer demand owing to the economic slowdown around the world. Falling consumer demand might lead to a downward spiral in global manufacturing, which would damage many cross-country supply chains. The United Nations estimated that global FDI would decline between 30% and 40% during 2020 and 2021. Though the supply chain disruptions caused by COVID-19 might be temporary, the dent of demand and production in developed countries and the lack of investment capital in developing countries could have a long-lasting impact on global production.[52]

COVID-19 hit China, Europe, and the US, all of which were global value-chain hubs. Among them, China was the first major economy to control the pandemic and return to growth. In Q1 2020, China experienced the first contraction since 1992, with the economy shrinking by 6.8% year-on-year. In Q3, China recorded a 4.9% quarterly growth. China was expected to grow by 2.2% in 2020, while the IMF estimated the global economy would contract by 4.4%.[53]

Stay or Leave

In China for China

> *For companies that have yet to move, this is what has held them back. It is next to impossible to beat the level of supply chain integration found in China. In many cases, investors in China have strong relationships with vendors and suppliers that have been built and, more importantly, perfected quality assurance (QA) over decades. Customers are unwilling to accept dips in quality.*
>
> - Maxfield Brown, Business Intelligence Advisory, Dezan Shira & Associates [54]

[50] Saheli Roy Choudhury, "Apple supplier Foxconn is ahead of its peers in diversifying out of China, analyst says," CNBC, https://www.cnbc.com/2020/08/14/apple-supplier-foxconn-ahead-of-competitors-in-diversifying-out-of-china.html, 13 August 2020, accessed 22 December 2020.

[51] The Chinese New Year Period lasts for 15 days. Since factory workers usually go home to spend the Chinese New Year with their families, all the factories in China are usually closed for about two weeks.

[52] Adnan Seric et al., "Managing COVID-19: How the pandemic disrupts global value chains."

[53] Lily Luo, "China becomes first major economy to recover from COVID-19 pandemic."

[54] Melissa Cyrill, "Shifts in China's Industrial Supply Chain and the US-China Trade War."

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China had been the top manufacturing country since it overtook the US in 2010. China's exports accounted for 22% of the world's exports in 2019. [55] In a survey of well-established, large American companies operating in China, over 90% stated they were affected by the trade war, 47% saw their costs increased by up to 10%, and another 16% increased by up to 30%. While the costs of doing business in China were increasing, only fewer than 20% started relocating manufacturing outside China[56] because the many factors that attracted them to China in the first place still held true. For example, companies could adopt "in China for China" strategies to meet domestic demand in China. They could also leverage the well-established integrated network of supply vendors and production facilities in China to scale up their production of any kind of electronic device in record time.

> *China is more than a market for us. It is increasingly a major innovation hub. Partnership and innovation underpin our strategy of "In China for China" and "In China for the World."*
>
> - Leif Johansson, Chairman of AstraZeneca PLC [57]

> *In contrast to some global narratives, our China-based data suggest that the majority of our members will not be packing up and leaving China anytime soon. Of course, some companies in certain industries may diversify away from China or even expand manufacturing operations in the US given the current climate. But this is a costly, time consuming, and largely irreversible process. It is worth emphasizing that China appears ahead of the global curve when it comes to restarting the economy following months of lockdown, and many of the reasons why companies are in China in the first place still hold true today. As a result, we expect to see companies adopting a "China + 1" strategy as a way to diversify supply chain risks while tapping into China market opportunities.*
>
> - Alan Beebe, President of the American Chamber of Commerce China [58]

Additionally, making changes to existing value chains was not always easy and depended on a number of factors. Capital-intensive value chains required fixed investments of hundreds of billions of dollars and had strong economies of scale, which made them costly to move. Knowledge-intensive value chains relied on specialized ecosystems in specific locations where specialized suppliers with required skills were located. It could be costly for a company to move out of the supportive, well-established ecosystem. Additionally, the general trend of company movement, overall growth of the market, the location of existing and/or potential consumer markets, trade intensity, and innovation dynamics also needed to be considered.[59]

Government Support

The Chinese government was expected to encourage FDI and the development of cross-border e-commerce. Local governments, too, gave incentives to encourage companies to invest in the innovative high-tech industries. The Guangdong provincial government, for example, announced a series of measures to encourage foreign investment, such as opening up the market, giving talent and land-use incentives, offering favorable tax and financial incentives, and strengthening intellectual property (IP) protection. In particular, foreign companies were

[55] Kathrin Hille, "China's share of global exports falls in supply chain rethink."
[56] PwC Globally, AmCham China, and AmCham Shanghai, *Supply chain strategies under the impact of COVID-19 of large American companies operating in China*, AmCham China, 17 April 2020.
[57] Liu Zhihua, "In China for China and the world," *China Daily*, 12 April 2019.
[58] PwC Globally et al., *Supply chain strategies under the impact of COVID-19 of large American companies operating in China*.
[59] Susan Lund et al., *Risk, resilience, and rebalancing in global value chains*, McKinsey Global Institute, 6 August 2020.

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allowed to open wholly owned IT companies; setting up joint ventures had been required in the past. [60]

In July 2020, China's FDI reached USD9.05bn, representing 12.2% growth year-on-year and the fourth straight month of increase after the pandemic peaked in China in February. In contrast, FDI flows in the world were expected to fall 30% year-on-year. [61]

Moving to Other Countries

In some developed countries, politicians called for a rethinking of global production outsourcing as a way to increase supply chain resilience and avoid future supply bottlenecks. For example, France called for other EU governments to rethink global value chains to ensure "sovereign" and "independent" supplies.[62] This also forced companies to rethink their global production outsourcing approach. In the past, companies' outsourcing decisions were based on economic considerations, such as cost savings, inventory reduction, and maximum asset utilization. COVID-19 was also a wake-up call to companies to appreciate their vulnerability to global shocks and the associated costs. [63]

In June 2019, Apple required its suppliers to explore the possibilities of deploying 15% to 30% of their production capacity from China to other countries in South Asia. The major assemblers of Apple, including Foxconn, Wistron, and Pegatron, all had developed assembling facilities in India. Cheng Uei Precision Industry Corporations, a cable and connector maker known as Foxlink and owned by the brother of Foxconn founder Terry Gou, announced the start of mass production for Apple in its new plant in India by the end of 2020.[64]

Foxconn dismissed 50,000 seasonal workers in China between October and December 2019 because iPhone sales slowed, and it wanted to explore more investment opportunities in India.[65] Foxconn was well aware that many of its competitors wanted to be an Apple supplier for a number of reasons. Apple had a reputation for its innovativeness, which had its loyal customers. This gave confidence to Apple's suppliers, as there was always a demand for their goods and services. With a powerful customer like Apple, suppliers had to maintain good-quality goods at the right price to maintain their supplier positioning.

On the one hand, the US-China trade war forced Apple to consider diversifying production. Other considerations included a lower birth rate, higher labor costs, and the risk of concentrated production in one country. On the other hand, as China had been the manufacturing base for Apple for two decades, Apple announced in late February 2020 at the peak of COVID-19 in China that the company did not plan to make a quick move out of China.

Given the size and scale, Apple had to face many challenges if leaving China. China was not only able to offer hundreds of thousands of skilled workers at short notice to cope with rapidly rising orders to support Apple's rapid growth, but also to provide a comprehensive ecosystem of components, logistics, and talent to service Apple's manufacturing sites. In the early 2000s, local governments invested in infrastructure, including water, utilities, roads, and even dormitories for workers. They also simplified the import and export process; the customs facilities near Foxconn's factory in Zhengzhou was a good example. Compared to the well-

[60] Melissa Cyrill, "Shifts in China's Industrial Supply Chain and the US-China Trade War."
[61] Evelyn Cheng, "How China is preparing its economy for a future where the U.S. isn't the center of global demand," CNBC, 31 August 2020.
[62] Adnan Seric et al., "Managing COVID-19: How the pandemic disrupts global value chains."
[63] Ibid.
[64] Debby Wu, "Apple cable supplier to start mass production in India soon," *Bloomberg*, 24 October 2020.
[65] Melissa Cyrill, "Shifts in China's Industrial Supply Chain and the US-China Trade War."

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established ecosystem in China, companies might struggle with the lack of proper infrastructure in other developing countries.[66]

> *With India's labour cheaper compared with China, and the gradual expansion of its supplier base here, Apple will be able to use the country as an export hub.*
>
> - Neil Shah, researcher of Counterpoint [67]

In July 2020, Foxconn announced it would invest about USD1bn in three years to expand its factory in Spriperumbur, southern India, which made the iPhone XR. The expansion would create about 6,000 jobs. Foxconn had another factory in a nearby state, Andhra Pradesh, which made smartphones for China's Xiaomi. India was the world's second-biggest smartphone market. iPhone accounted for 1% of smartphone sales in India. Manufacturing iPhones in India could help Apple save on import taxes. [68]

Foxconn's operation was not always smooth. In January 2020, Maharashtra Industries Minister confirmed that Foxconn's USD5bn investment to build an electronic manufacturing factory was cancelled, mainly because of encumbrance issues in the land lease and an internal dispute between Apple and Foxconn.[69]

Besides India, some companies would choose Southeast Asian countries as their destinations when moving some of their manufacturing plants out of China. As part of ASEAN, they formed a favorable trading partnership with China. When companies moved part of their supply chains or opened new factories in these countries, they replaced China with these countries as the "country of origin" when trading with the US and maintained their trading relationships with China. Foxconn invested USD203mn in Vietnam between 2018 and 2019 to manufacture and assemble computers, car parts, and other electronics.[70] The networking equipment was subject to the US tariffs, so Foxconn quickly removed such production from China. Foxconn's factory in Bac Vinh, Vietnam, became the manufacturing base for networking hardware to export to customers including Cisco Systems in the US.

> *One square meter of land in one of the new industrial parks in Hai Duong Province cost USD60 four months ago. Now the price has skyrocketed to USD90, mainly because of the trade dispute.*
>
> - Hung Chih-hua, Chairman of Sheng Yu Construction Co. Ltd. [71]

Though there were problems such as the lack of technical skills of Vietnamese workers, the Vietnamese government invested a lot in developing the basic infrastructure and skillfully balanced its relations with both the US and China politically and economically. [72]

[66] Lauly Li and Cheng Ting-Fang, "Apple weighs 15 percent-30 percent capacity shift out of China amid trade war," *Nikkei Asia,* 19 June 2019.
[67] Sankalp Phartiyal and Yimou Lee, "Apple supplier Foxconn to invest $1 billion in India," Reuters, 11 July 2020.
[68] Ibid.
[69] Sharad Vyas, "$5 billion Foxconn plant deal scrapped: Industries Minister," *The Hindu,* 7 January 2020.
[70] Dat Nguyen, "Foxconn says Vietnam is biggest manufacturing hub in Southeast Asia," *VN Express,* 25 June 2020.
[71] Elaine Huang, "Challenges and opportunities of manufacturing in Vietnam," *Common Wealth,* 18 January 2019.
[72] Ibid.

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Looking Forward

> *The past model, where [manufacturing] is concentrated in just a few countries like a world factory will no longer exist. What we think is more likely in the future are regional production networks.*
>
> - Liu Young-Wei,Chairman of Foxconn [73]

The US-China trade war coupled with COVID-19 triggered multinational companies to seriously consider whether they should diversify their sourcing strategies or completely move out of China. Companies might not be able to afford to relocate all their factories out of China or to find the right replacements for their Chinese sourcing vendors. It took many years to establish a supply chain ecosystem, and China played a key role in production, sourcing, and procurement needs along the global supply chains.

Foxconn, like other multinational companies, had to speed up its decision at the board level with regard to its manufacturing facilities in China and future business expansion. This decision would depend on the company's view of how the future global supply chains would be reshaped and its assessments of the risks and opportunities of each option.

[73] Kathrin Hille, "The great uncoupling: one supply chain for China, one for everywhere else."

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EXHIBIT 1: FINANCIAL PERFORMANCE

Item	2019	2018	2017
Net revenue	99,802,129	142,057,432	147,815,617
Operating cost	(89,851,743)	(128,564,689)	(133,556,310)
Gross profit	9,950,386	13,492,743	14,259,307
Operating expenses	(4,656,094)	(4,886,359)	(3,733,165)
Net operating income	5,294,292	8,606,384	10,526,142
Non-operating income	3,081,986	2,726,067	920,086
Income before tax	8,376,278	11,332,451	11,446,228

Source: Foxconn Annual Reports.

EXHIBIT 2: THE NUMBER OF FOXCONN WORKERS IN CHINA, 2009–2019

Source: Varied sources, mainly from Foxconn Financial Services, "Changes of worker numbers in the world's largest employer Foxconn," 3 December 1998; KKNews, "Do you know which Chinese companies have more number of workers than Foxconn?," 27 July 2019.

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EXHIBIT 3: TIMELINE OF US-CHINA TRADE WAR BETWEEN 2008 AND 2000

Time	Action	Tariff Rate
22 January 2018	Trump signs tariffs on imported solar panels for all countries	
8 March 2018	Trump signs tariffs on steel and aluminum for all countries	
2 April 2018	China puts additional 15/25% tariffs on USD3 billion worth of US goods	
6 July 2018	US tariff action: USD34 billion China tariff action: USD34 billion	25% 25%
23 August 2018	US tariff action: USD 50 billion China tariff action: USD 50 billion	25% 25%
24 Sept. 2018	US tariff action: USD50 billion China tariff action: USD50 billion US tariff acion: USD200 billion China tariff action USD60 billion	25% 25% 10% percent 5–10%
10 May 2019	US tariff action: USD 250 billion China tariff action: USD110 billion	25% 20–25%
September/ 1 Oct 2019	US tariff action: USD 250 billion US tariff action: USD 300 billion China tariff action: USD 110 billion China tariff action: USD 75 billion	30% 15% 20–25% 5-10%
14 February 2020 (Phase One deal)	US tariff action: USD 250 billion US tariff action: USD 300 billion China tariff action: USD 110 billion China tariff action: USD 75 billion	30% 7.5–15% 20–25% 2.5–5

Source: Katharina Buchholz, "U.S.-Chinese Trade War: A Timeline," https://www.statista.com/chart/15199/us-chinese-trade-war-escalates/, 17 August 2020, accessed 14 October 2020.

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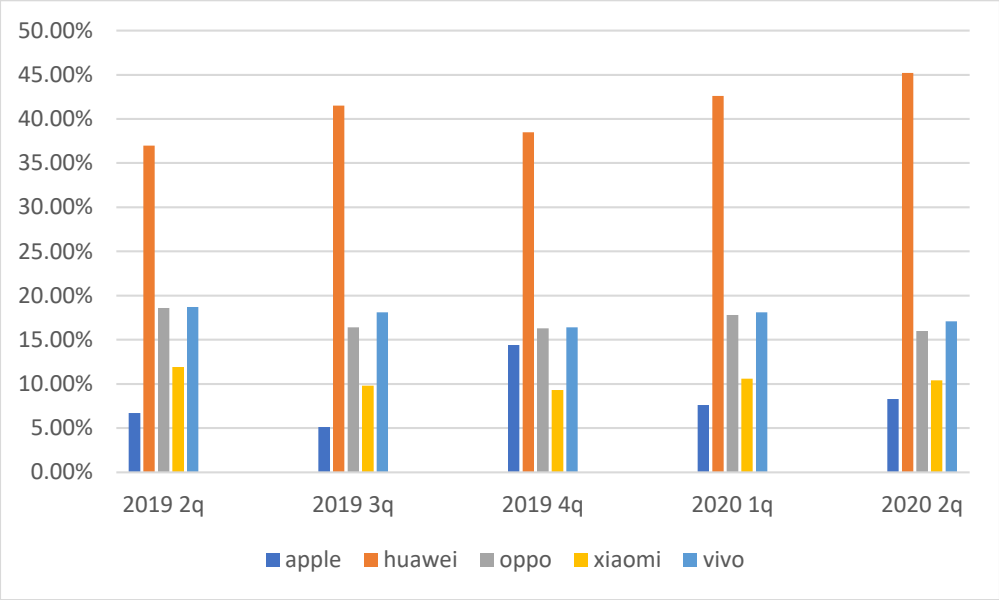
EXHIBIT 4: SMARTPHONE VENDOR MARKET SHARE IN CHINA, 2019–2020



Source: Statista, "Vendors' market share of smartphone shipments in China from 1st quarter 2014 to 2nd quarter 2020," https://www.statista.com/statistics/430749/china-smartphone-shipments-vendor-market-share/, accessed 15 September 2020.

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