

# **The Relocation of Supply Chains from China and the Impact on the Chinese Economy**

**Shaomin Li**

The U.S.-China trade war has had a huge impact on the supply chains in China, accelerating their relocation that had already begun due to rising taxes, costs of labor, and other input factors. The exodus reported in the past year is only the tip of the iceberg, as more serious effects will not become apparent immediately. A major effect of the relocation on China is job losses, which may reach as many as 5 million in the coming years. Given the unlikelihood of a quick end to the trade war and the reluctance of the Chinese Communist Party (CCP) to make structural changes, the long-term prospects for supply chains in China are not promising because not only will existing firms gradually reduce their exposure to political and economic uncertainties, but also potential newcomers are likely to avoid China. Although the CCP rolled out some policies that may help alleviate the shock, it has yet to come up with specific policies to effectively address the problem.

In early 2018, the Trump administration began to use tariffs as a weapon to pressure China to reduce the trade deficit, starting what we know of today as the “trade war.” Since then, the demands on China from the United States have evolved from balancing trade to making “needed structural changes,” particularly in the areas of forced technology transfers, intellectual property protection, non-tariff barriers, cyber intrusions and cyber theft of trade secrets, among others.<sup>1</sup> In August 2019, President Trump demanded that American companies “immediately start looking for an alternative to China.”<sup>2</sup>

The trade war has greatly affected the political economy of China. Economically, it has negatively affected the manufacturing sector, substantially reducing trade with the United States, deterring foreign investments, disrupting supply chains, and accelerating the relocation of supply chains from China. Here I will focus on how the relocation of supply chains from China affects the Chinese economy.

## **The Relocation of Supply Chains from China**

A “supply chain” refers to the network of firms involved in the production, transactions (such as buying and selling), and transfer of goods from the beginning (such as sourcing the raw materials) to the end (such as delivering the finished products to customers or other end-users). In this article, I will focus on the production side of the supply chain.

There is little doubt that the U.S.-China trade war has had a fundamental impact on supply chains in China, at an unprecedented scale and scope. A survey of press reports on firms relocating or considering relocating from China between October 2018 and October 2019 records more than 50 firms, including Apple, Samsung, HP, Dell, Microsoft, Foxconn, Suzuki, and Fuyao Glass

(whose much-covered expansion to Ohio was documented in the film *American Factory*). In terms of country of origin, most of the firms are Japanese and American. In terms of target countries, South Asia (Vietnam, Thailand, Taiwan, India, and Cambodia) are the most frequent destination, followed by Mexico. Many Japanese firms returned home (see Table 1). These cases are only those that are known; more importantly, when many of them leave, their suppliers or clients may leave as well. For example, when Apple announced that it will relocate some of its iPhone production from China, seven Taiwanese firms (known to have been Apple suppliers) also relocated part of their production to avoid tariffs.<sup>3</sup>

According to a survey conducted by the American Chamber of Commerce, “More than 70 percent of U.S. firms operating in southern China are considering delaying further investment there and moving some or all of their manufacturing to other countries as the trade war bites into profits.” Furthermore, it is not only the foreign firms that are considering leaving China: “Half of their Chinese counterparts share the same consideration.”<sup>4</sup> In a survey conducted by Baker McKenzie of 600 firms in the Asia-Pacific region, “93 percent of Chinese companies ‘were considering making some change to their supply chains to mitigate the effects of trade tariffs,’ and ‘82 percent of respondents are changing their supply chains to counter the trade war.’”<sup>5</sup>

The trend of leaving or considering to leave is increasing with time. According to a managing partner at AC Trade Advisory, Angelia Chew, many companies, “Have gone past the observation stage and are now putting things into action.”<sup>6</sup>

Tim Cook, CEO of Apple, Inc., has stated: “We believe the economic environment in China has been further impacted by rising trade tensions with the United States.” Arista Networks, Inc. issued a statement in 2018 saying that, “With judicious planning by our manufacturing teams, we are reducing our dependency on China-sourced components gradually and increasing our manufacturing capacity outside China next year.”<sup>7</sup> Kiyofumi Kakudo, CEO of PC maker Dynabook, said that, “We need permanent measures to avoid the risk of tariffs. ...”<sup>8</sup>

For Universal Electronics, its decision to relocate its manufacturing from China to Mexico was driven by the rising labor costs in China: “Frankly, we have been preparing for this shift because the increasing labor rates in China have made those labor rates less and less favorable over time to those in other countries.”<sup>9</sup>

Based on the surveys, media reports, and other anecdotal evidence, it can be concluded that the majority of manufacturing firms in China, including Chinese firms, are looking into the option of relocating elsewhere at least part of their activities.

### **Reasons for the Relocation of Supply Chains from China**

When companies select a location for their supply chains, they must consider the following options: whether to keep most of their supply chains within a single country or to have parallel

supply chains or different parts of a supply chain in different countries. Their selections are based on country-, industry-, and firm-level factors.<sup>10</sup>

The country-level factors refer to a country's macro environment that facilitates or constrains a firm's supply-chain operations. More specifically, the macro environment includes the following factors: the political, legal, economic, and social (cultural) systems, input factors (cost of labor, land, materials, and other inputs), trade barriers, exchange rates, and location externalities (which arise from the concentration of related firms clustering in the same location, such as IT firms in Silicon Valley).

The relocation of supply chains from China is primarily due to country-level factors, the most important of which is the trade war, whose effects are multi-dimensional, including increased tariffs and the high-level uncertainty and unpredictability that are salient features of the trade war.

The first and most immediate factor is the increased tariffs. The first wave of tariffs (List 1 and 2 of \$50 billion worth of goods, as reported by the Office of the U.S. Trade Representative) had the greatest impact on the following eight industries: (1) instruments and meters, (2) special equipment, (3) railways, ships, aircraft, and other transportation equipment, (4) general equipment, (5) electrical machinery and equipment, (6) computers, communications, and electronic equipment, (7) rubber and plastic products, and (8) fabricated metal products. The second wave of tariffs (List 3 of \$200 billion worth of goods) added the following to those goods that were seriously impacted: (1) furniture, (2) leather products and shoes, and (3) wood products. The third wave (List 4 of \$300 billion worth of goods), which is on hold, would add to: (1) cultural, educational, art, sports, and recreational products, (2) garments and apparel, and (3) textiles.<sup>11</sup> All these industries heavily depend on exports to the United States. Table 1 shows that most of the firms that are leaving are involved in IT products, electronics, computers, and auto parts. The fact that auto and auto-part industries, which are less exposed to the U.S. market, are also leaving and indicating a worsening performance<sup>12</sup> suggests that the impact of the tariffs has already reached industries focusing on the domestic market.

A second factor is the political economy of China, which is the most fundamental reason behind the trade war. The most salient feature of the political economy of China is that the goal of the Chinese Communist Party is to maintain party rule. Its policies toward business and foreign firms vary depending on its priorities. For example, when capital and managerial knowledge were needed during the early stages of the market reforms, the party gave preferential treatment to foreign firms. When capital became more abundant and local firms acquired management know-how, the earlier preferential policies to foreign firms became more discriminatory.<sup>13</sup> In such an environment, it is impossible for firms to project trends and plan accordingly because party preferences change over time and party policy making is opaque. The fact that China lacks impartially enforced laws is another factor prompting firms to relocate their supply chains. In international business, companies tend to ask their home-country government to help them deal with, or even to pressure, the host-country government if they want to improve the operations

environment. This strategy is most effective if the home-country is bigger and more powerful than the host country. In the case of China, given its size and its powerful government, few home-country governments are able to deal effectively with the Chinese government. For fear of retaliation, most home-country governments and firms avoid criticizing the Chinese government.<sup>14</sup>

The effects of the political factors are strong in the case of changes in supply chains, which are illustrated in the following examples. Due to the trade war, the Chinese government decided to import pork from Russia instead of from the United States. In so doing, African swine fever, a highly contagious and deadly virus, was brought into China from its northern neighbor, drastically disrupting China's supply chain of pork.<sup>15</sup> Another example is the Chinese government's threat to use its market power with respect to the supply of rare earths as a weapon in the trade war, which has spurred development of supply capabilities of rare earth by other countries, eventually hurting the Chinese position.<sup>16</sup>

A third important factor that has led to the relocation of supply chains from China is the rising costs of input factors, especially the rapid increase in labor costs. For example, between 2011 and 2016, the average hourly wages for factory workers rose from \$2.20 to \$3.60, a 64 percent increase. This is on par with that in more developed countries such as Portugal, and five to seven times higher than hourly wages in India and Sri Lanka.<sup>17</sup> In addition to the rising labor costs, other operational costs are rising as well. According to Cao Dewang, the famed chairman of Fuyao Glass who opened a factory in Ohio, the high taxes and fees levied on firms in China were a major consideration for his relocation.<sup>18</sup> An article on why Chinese firms are relocating to the United States cites that land, electricity, natural gas, and logistical costs are higher in China than they are in the United States.<sup>19</sup>

The industry-level factors include the technologies that are used, and the type of products made in each industry. In some industries, the fixed costs of setting up a production plant are very high. This will favor centralizing production in one country in order to achieve economies of scale to lower unit costs. Semiconductor manufacturing is one such example because it may require up to \$5 billion to set up a state-of-the-art semiconductor manufacturing facility. Conversely, products that require relatively low levels of fixed costs for production, such as garments, can be spread among different countries. Products that must be continuously produced and have a low value-to-weight ratio, such as steel, also tend to be concentrated in one location.

The firm-level factors include the firm's goals, strategies, and capabilities. Since our focus is on the macro-level factors, we will not discuss the firm-level factors here.

The countervailing forces that may help China retain supply chains are (1) the high productivity of Chinese workers, (2) the extensively developed infrastructure, and (3) the high level of development in the manufacturing sector with respect to its value-added capabilities.<sup>20</sup>

### **The Effects of Relocations on the Chinese economy**

## 1. *Effects on Employment*

This is the issue that most concerns the Chinese government, as unemployment will directly affect tens, if not hundreds, of millions of workers and may lead to social unrest.<sup>21</sup> According a report by two CICC (China International Capital Corp.) economists, since the first wave of tariffs (on \$50 billion worth of goods) by the United States in July 2018, total employment in the Chinese manufacturing sector has declined by 5 million, which accounts for 0.7 percent of China's total employment and 3.4 percent of China's manufacturing employment. It should be noted that the job losses are not evenly distributed across all industries. The industries hardest hit include electronics, special equipment, computers and equipment, rubber and plastic, general equipment, measurement instruments, railways, ships, aircraft, other transportation equipment, and metal products. The CICC report estimates that job losses in these most vulnerable industries amount to between 1.3 and 1.9 million, or 0.9–1.2 percent of employment in the manufacturing sector. Another assessment by an economist at Citigroup puts the near-term job losses in China at 1.77 to 2.95 million, and the long-term job losses from 3 to as high as 5 million. If we assume that the total number of unemployed people is about 9 million, as revealed by the available statistics,<sup>22</sup> then the 2 to 5 million jobs lost due to the relocation of supply chains will sharply increase the unemployment rate in China during the next several years. The negative effects of the relocation of supply chains from China due to the trade war will peak in 2020. For regions and industries that are most seriously affected, such as the computer and communication industries, and Guangdong and the coastal regions, the impact may be even worse.<sup>23</sup> Job losses may also be detected indirectly from the reduced consumption of electricity. In the first three quarters of 2019, electricity generated by Beijixing Power Grid was 116,650 gigawatts, which is 45.4 percent lower than that in the previous year.<sup>24</sup>

Another important effect of the relocation on employment is the substantial reduction in overtime work opportunities due to the reduction in orders. In the Chinese manufacturing sector, overtime is an indispensable mechanism to maintain high productivity because by having workers work overtime, a firm can more fully utilize its machines or assembly lines. This also allows firms to reduce the total number of workers and therefore the firms can save on workers' benefits as well as on overhead costs, even if the firm pays 1.5 times the ordinary pay for overtime wages as required by the Chinese government. Two surveys report that more than 40 percent of the respondents worked overtime.<sup>25</sup> As such, overtime pay was an important, regular source of income for workers prior to the trade war. With the substantial reduction of overtime, the productivity of firms was affected, and the incomes of workers were reduced.<sup>26</sup>

In Chinese society, there is widespread pessimism and fear about future economic prospects. A post entitled "Top Economist's Candid Advice for the Last Months of 2019," which went viral on Weibo and WeChat, suggested ten points of advice: 1.) hoard cash, buy gold, accumulate U.S. dollars, and stockpile pork; 2.) do not quit your job, do not start a business, do not invest, do not mortgage, and do not leverage; 3.) do not borrow, and, more importantly, do not lend to friends; 4.) eat at home, return to basic consumption, and do not be extravagant; 5.) stop all extramarital

affairs; 6.) be humble and show respect for low-income people; 7.) sell your home, especially if you have more than one; 8.) get married to reduce living expenses, but delay having children; 9.) exercise and do not get sick; 10.) survive!<sup>27</sup>

## *2. Long-term and Structural Effects*

Relocating supply chains takes time. Finding new locations is challenging as few countries can match China in terms of size, skilled labor, infrastructure, and the number of capable firms. Furthermore, many investments are sunk and cannot be recouped or transferred, such as good relationships with local governments or factories or equipment that are custom-made to match local specifications or requirements. This is why experts warn that the main effect of the relocation of supply chains from China will not be revealed immediately and will only gradually become obvious in the years to come. This delayed effect may be exacerbated by firms realizing that U.S.-China trade frictions are a new normal. Firms that plan to set up supply chains will then stay away from China. In sum, the long-term effects will be worse than the short-term effects.

For industries that require high fixed costs and large economies of scale, such as semi-conductors, aircraft, or automobiles, relocation will take a longer time. Conversely, for industries characterized by low fixed costs, a low minimum efficient scale, or flexible manufacturing technology, moving is relatively easy. Suppliers of goods that have a high value-to-weight ratio and serve universal (as opposed to custom-tailored) needs, such as standard electronic components, are relatively easy to move. Thus, the exodus of makers and suppliers of electronic components, as well as makers of consumer products, can be expected to occur sooner, whereas the relocation of manufacturers that employ large assembly lines will take place later.

The relocation of supply chains will push China to accelerate its efforts to develop its own supply chains.<sup>28</sup> For example, Huawei is now forced to seek more domestic suppliers for its smart phones due to the U.S. sanctions. The consequences of such an internalization of supply chains by China will result in its future supply chains being less connected with the international market.

Economist Jing Liang argues that the trade war and the relocation of supply chains will push the Chinese economy into what he calls an ICU-economy. To secure its own survival, the party will increase the pace of resource extractions from the private sector without providing policies or resources for it to grow. This is like a sick old man in intensive care who depends on blood from the young. Liang argues, however, that the IT capabilities of the Chinese state and help from the outside world (as the outside world does not want to see the Chinese economy to collapse) may contribute to sustaining the Chinese economy for a long time in its present state.<sup>29</sup>

### **Chinese Policies to Reverse these Trends**

So far, the Chinese government has not announced any clear policies regarding the loss of supply chains. It has taken measures that will help mitigate the effect of the trade war, and thus these

measures can be viewed as indirect or implicit policies to stem the flight of firms. Below are the major such policies.

A first and quick measure the government took was to devalue the yuan to counter the decrease in exports and foreign investments. Since early 2018, the exchange value of the yuan to the U.S. dollar has dropped from about \$6.30 per dollar to about \$7.10 per dollar, or 11 percent.<sup>30</sup> In addition, the government has lowered the reserve requirement for banks and has increased money supply to stimulate the economy.<sup>31</sup> It has also made the buying and transfer of sending foreign currencies more difficult so as to reduce capital flight.<sup>32</sup> The devaluation of the yuan will be effective to stimulate exports, but it also will hurt the buying power of Chinese firms and Chinese residents. Similarly, lowering the reserve requirements will have its limits. Finally, increasing the money supply may exacerbate China's already serious debt issue.

Next, the government rolled out favorable policies and laws to pacify and attract foreign investors. In 2019 the Chinese government published its "Foreign Investment Laws" and a series of policies aimed at further lowering entry barriers and encouraging foreign investment to enter the following industries: transportation, infrastructure, culture, manufacturing, mining, and agriculture.<sup>33</sup> The problem with such an approach is that the very success of the policy will be a source of concern for potential investors because the powerful government can give all the green lights required to jumpstart a project, only to then easily kill it by a simple administrative order. By their nature, supply chain investments tend to be long-term, and, logically, investors prefer a consistent political and economic environment with fair and effective protections for their investments. Such an environment is not attainable under the current political system. As an editorial on China's intellectual property violations in *The American Spectator* underscores, China's rule over law instead of rule of law "is a major reason competitors are attempting to do business elsewhere."<sup>34</sup>

Another effort has been to expedite the development of 5G in China to counter the economic slowdown caused by the loss of supply chains.<sup>35</sup> According to Chinese media, the government plans to invest up to one trillion yuan (\$140 billion) in the development of the 5G network to revitalize the economy.<sup>36</sup> This strategy will likely spur some growth and related technology advances. However, such a state-sponsored effort inevitably will lead to wasteful use of capital and a premature retirement of the 4G network will cause major investment losses.

Further developing the Belt and Road Initiative (BRI) may help compensate for the loss of supply chains.<sup>37</sup> The BRI may employ the excess capacities in infrastructure construction that China accumulated during its boom years and it has potential strategic value for China's global expansion,<sup>38</sup> but its help in mitigating the economic losses from the relocation of supply chains is limited. It requires a huge cash investment, which may not be feasible since China's domestic economy is slowing down and needs cash injections. Furthermore, the BRI projects primarily utilize construction capacities and thus cannot replace the loss in high-tech capacities that has occurred due to the relocation of supply chains (nevertheless, the jobs generated by the BRI may soften the blow for unskilled workers). Last, the BRI projects are subject to closer scrutiny by the

host countries that usually demand that the BRI projects hire more local workers and generate greater benefits for the host-country economy.

Other policy measures that might help absorb the shock of supply chain losses include the campaign for “all to create startups and millions to innovate” (大众创业，万众创新)<sup>39</sup> and the “night economy” (夜间经济) campaign to stimulate consumption.<sup>40</sup>

### 1. *The Refusal to Make Structural Changes Hurts China*

While the Chinese government rejects demands from the United States to make structural changes, such changes would help China develop its supply chain capability in the long run. Simply put, the structural changes would change the CCP-run economy to a market economy based on rule of law. In a study based on the use of trade data on how the political economy affects trade flows, the authors show that if *relation-based* countries (countries that are corrupt and have weak rule of law) embrace the rule of law and become *rule-based* (governed by fair and transparent public rules that are impartially enforced), more countries will trade with them.<sup>41</sup> China has made great gains in international trade and in becoming one of the largest hubs in global supply chains, despite its relation-based system. If China can make a genuine effort to embrace the rule of law and to create a more open and fair market, then instead of losing supply chains, it will become a more desirable location, given its size, advanced infrastructure, and productive labor force.

In conclusion, available data, reports, and analyses all indicate that the relocation of supply chains from China due mainly to the trade war has already begun and in the future, it will likely become worse. Many firms that have not yet made the decision to leave are now considering their options. The effect of relocation on the Chinese economy will be significant and long term. So far, the government has been taking measures to counter the economic slowdown caused by the trade war. Whether these measures will effectively stem the loss of supply chains is yet to be seen. There is no indication that the Chinese government is making structural reforms, even though such reforms will be necessary for China’s long-term development of supply-chain capabilities.

**Table 1. List of Companies Leaving or Considering Leaving China**

<b>Firm</b>	<b>Country of Origin</b>	<b>Industry</b>	<b>Target Country</b>
<b>Amazon</b>	U.S.	online retailer	
<b>Apple</b>	U.S.	IT, new iPhones	India
<b>Arista Networks, Inc.</b>	U.S.	networking switches and other communications equipment	
<b>Asahi Kasei</b>	Japan	auto parts	Japan
<b>Asics</b>	Japan	shoes	Vietnam
<b>Asustek</b>	Taiwan	computers	Taiwan



<b>Avery Dennison</b>	U.S.	materials science	
<b>Brooks Sports</b>	U.S.	shoes	Vietnam
<b>Canadian National Railway Co.</b>	Canada	railways	
<b>Capstone International HK Ltd/Florida</b>	U.S./Hong Kong	sourcing for big-box U.S. retailers	Thailand
<b>Carrifour</b>	France	retailer	
<b>Casio Computer</b>	Japan	wristwatches	Thailand
<b>ChinaNetCloud</b>	U.S.	cloud services	U.S.
<b>Citizen Watch</b>	Japan	wristwatches	Thailand
<b>Compal Electronics</b>	Taiwan	routers, other telecom equipment	Taiwan, other countries
<b>Dell</b>	U.S.	computers	Taiwan
<b>Enphase Energy</b>	U.S.	solar microinverters	Mexico
<b>Epson/Seiko</b>	Japan	printing and robotics	
<b>Foxconn</b>	Taiwan	electronics	U.S. and other countries
<b>Funai Electric</b>	Japan	TVs	Mexico
<b>Fuyao Glass</b>	China	auto glass	U.S.
<b>GoerTek</b>	China	wireless earphones for Apple	Vietnam
<b>GoPro</b>	U.S.	video cameras	Mexico
<b>Groupe PSA</b>	France	automobiles	
<b>G-Tekt</b>	Japan	auto parts	Japan
<b>HP</b>	U.S.	computers	Taiwan
<b>Inventec</b>	Taiwan	Computers and electronics	E. Europe, other countries
<b>Iris Ohyama</b>	Japan	fans	S. Korea
<b>Keihin</b>	Japan	auto parts	Japan
<b>Komatsu</b>	Japan	construction equipment	Japan, Mexico
<b>Kyocera</b>	Japan	printers	Vietnam
<b>Microsoft</b>	U.S.	software	
<b>Mitsuba</b>	Japan	auto parts	U.S.
<b>Mitsubishi Electric</b>	Japan	laser processing machines	Japan
<b>Nidec</b>	Japan	auto parts, home appliance parts	Mexico
<b>Nikon</b>	Japan	image products and others	
<b>Nintendo</b>	Japan	video game consoles	Vietnam

<b>Nitto</b>	Japan	electronic devices and others	
<b>Olympus</b>	Japan	cameras and others	
<b>Omron</b>	Japan	precision electronics	
<b>Panasonic</b>	Japan	stereos, other in-car equipment	Thailand
<b>Pegatron</b>	Taiwan	telecom equipment	India, Vietnam
<b>Ricoh</b>	Japan	printers	Thailand
<b>Samsung</b>	S. Korea	IT and electronics	
<b>Sharp</b>	Japan	computers	Vietnam
<b>Skechers USA</b>	U.S.	shoes	India
<b>Sony Mobile</b>	Japan	phones, accessories	
<b>Steve Madden</b>	U.S.	shoes	Cambodia and other countries
<b>Sumitomo Heavy Industries</b>	Japan	robot components	Japan
<b>Suzuki</b>	Japan	automobiles	
<b>TCL</b>	China	TVs	Vietnam
<b>Toshiba Machine</b>	Japan	injection molding machines	Japan
<b>Universal Electronics</b>	U.S.	TV remotes	Mexico
<b>Walmart</b>	U.S.	retailer	
<b>An unnamed handbag and luggage firm and its stitch-and-sew manufacturing clients</b>	U.S.	handbags and luggage	Vietnam

Note: Some of the companies may have closed or are considering closing part of their operations in China.

Data source: Compiled by author from published sources<sup>42</sup>

### **About the author**



Shaomin Li is Professor of International Business at Old Dominion University, where he holds the title of Eminent Scholar as designated by the State Council of Higher Education for Virginia. Professor Li graduated from Peking University (B.A., Economics) and Princeton University (Ph.D., Sociology) and was a post-doctoral fellow at Harvard University. He studies the global environment of business, with a focus on governance in changing societies. He has published in *Journal of International Business Studies*, *Journal of Comparative Economics*, *World Development*, *Harvard Business Review*, *The Wall Street Journal*, *The Financial Times*, and *The New York Times*. His most recent book, *Bribery and Corruption in Weak Institutional Environments*, was published by Cambridge University Press (2019). On two occasions, *The Economist* featured his research on rule-based versus relation-based governance. He is Executive Editor of the journal *Modern China Studies*. In 2008 the Governor of Virginia presented him with the Outstanding Faculty Award.

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<sup>6</sup> *Ibid.*

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