Why Will Trump Lose the Trade War?*

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Abstract

The escalating U.S.–China trade conflicts have increasingly shadowed the outlook of the world economy. The Trump administration aims to achieve its strategic goals including reducing current account deficits, promoting the U.S. manufacturing sector, and curbing Chinese high-tech industries by waging the trade war against China. This paper argues that the current account deficits and the declining manufacturing sector in the U.S. are mainly driven by its internal structural factors, such as low saving rates, high labor costs, and rising service sector, rather than by the import competition from China. Moreover, the trade war further deteriorates the U.S. current account deficits and erode its comparative advantage, and it forces China to invest more in technological innovation and human capital, and thus promote its progress in high-tech industries. Thus, the U.S. will not be able to achieve its strategical goals and eventually lose the trade war.

Keywords: Trade policy, tariff, current account, technological progress

JEL: F13, F32, F62

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I. Introduction

Trade protectionism struck back when U.S. President Donald Trump announced that the U.S. would levy additional 10% to 25% tariffs on the imports of steel and aluminum products in March 2018. This trade protectionism escalated promptly as President Trump levied the 25% import tariff on $50 billion worth of products from China based on Section 301, an investigation on China's practices on technology transfer, intellectual property, and innovation. China immediately retaliated with a tit-for-tat tariff on $50 billion imports from the U.S., which triggered the U.S. to levy a 10% tariff on another $200 billion imports from China. Moreover, China retaliated again with 5% to 10% tariffs on $60 billion imports from the U.S. The escalating trade conflicts between U.S. and China have led to the largest scale of trade war between the largest two economies after the World War II, shadowing the global financial market and the world economic outlook.

Why did the U.S. government revert to trade protectionism after having been the leader of globalization after the World War II? From the view of President Trump, the "unfair" trade policies made the U.S. firms and products uncompetitive. Thus, the country ran huge trade deficits every year. To "Make America Great Again", adopting trade protectionism policies is necessary before the U.S. re-negotiate a better deal with other countries on trade policies. China has the largest trade surplus with the U.S., thereby becoming the first target of U.S. trade protectionism. The ongoing trade conflicts between these two countries have put great pressure on the Chinese economy. However, will President Trump win the trade war?

The key criterion for the victory of a military battle is not the casualties of two combatants, but the achievement of their strategic goals. For instance, in the 1944 Normandy landing, the casualties of the Allied Forces were higher than those of the German Army. However, the Allied Forces successfully opened up the second front in Europe and achieved their strategic goals, and this success made the fundamental change for the World War II. Thus, Normandy landing has been marked as the great victory of the Allied powers in history. Similarly, the victory or failure of the trade war is crucially dependent on whether the Trump administration can achieve its strategic goals. Trump administration has set three strategic goals for the ongoing trade war: the first goal is to reduce the current account or trade deficits, the second is to promote the resurgence of the U.S. manufacturing, and the third is to curb China's high-tech manufacturing and maintain the technological advantage of the U.S manufacturing.

This paper argues that the U.S. is unlikely to achieve the three strategical goals by waging a large-scale trade war against China. Thus, the U.S. will eventually fail the trade war. First, the trade and current account deficits are mainly driven by the low household saving rates, high government deficits, and the demand for U.S. dollars from the rest of the world. The current account deficits are less likely to be reduced by simply increasing tariffs on imports from China without confronting the aforementioned fundamental causes. Given that President Trump implemented the policy of large-scale tax cuts, the current account deficits of the U.S. will not shrink, but will rather continue to expand in the near future. According to the latest statistics, the U.S. trade deficits in goods and services reached $621 billion in 2018, which was 12.5% higher than the number in 2017. Moreover, the deficits in goods trade exceeded $891 billion, reaching a historical record in the past decade. This exceedance signaled the failure of achieving the goal of reducing trade deficits through trade protectionism.

Second, the decline of the importance of manufacturing in the U.S. economy is not a short-term phenomenon, but a gradual process of structural transformation from a manufacturing economy to a service economy. Globalization does not weaken U.S. position in the world market of manufacturing products but allows U.S. multinational firms to utilize the resources and cheap labor across countries instead. Trade protectionism erodes the comparative advantage of the manufacturing sector in the U.S. by increasing the cost of intermediate inputs and shrinking foreign markets due to possible retaliation and the rising uncertainty of trade policies.

Third, China's high-tech manufacturing industries are closely linked to the global supply chain. Thus, curbing Chinese high-tech industries without damaging other firms along the global supply chain is difficult for the U.S. Moreover, many methods are available for technology transfers from developed economies to China, and preventing China from learning from the rest of world is nearly impossible for the U.S. Finally, China has three unique advantages in innovation: the easy accessibility of intermediate inputs, the large domestic market, and the large size of skilled labor force. The current ongoing trade war will also push China to rely more on itself in innovation and technological progress than on technology transfers from abroad.

The rest of this paper is organized as follows: Section II discusses the fundamental reasons for the U.S current account deficits and explains why trade protectionism might not help but deteriorate the trade deficits; Section III explains why the U.S. manufacturing sector has declined and levying tariffs on imports of intermediate inputs will reduce the competitiveness of U.S.

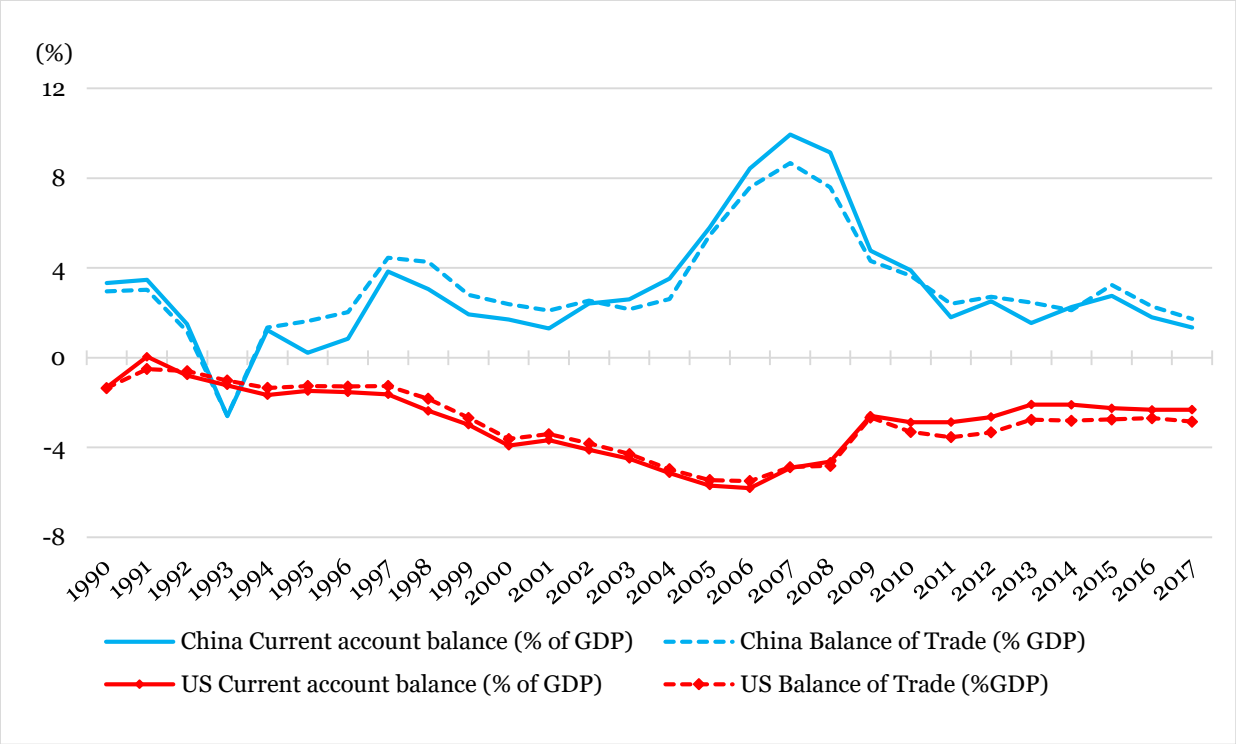
manufacturing firms and products; Section IV presents the reasons why trade conflicts will not slow down the technological progress and will not curb the high-tech industries in China; and Section V concludes the paper with policy remarks.

II. Reduce Current Account Deficits

The current account and trade deficits of the U.S. have been important reasons for trade protectionism advocated by the Trump administration. The current account includes net exports, net primary income or factor income, and net cash transfers. The net exports (balance of trade) take the majority of the current account. Thus, the current account deficits of the U.S. are largely from the trade deficits. Therefore, President Trump advocated trade protectionism to reduce trade imbalance and the current account deficits. China became President Trump's target because China has the largest trade surplus with the U.S. for years.

Figure 1 plots the time series of the current account and trade balance as a percentage of GDP for the U.S. and China. It shows that the U.S. current account deficits and trade deficits have been growing since the early 1990s and reached 6% of its GDP in the peak year of 2006. During the Great Recession from 2007 to 2009, trade and current account deficits went down to lower levels of approximately 2.7% and 2.6%, respectively. However, the trade deficits soon rebounded to 3.54% of GDP in 2011, which remained steady at roughly 2.8% for the following years. Different from the trade deficits, the U.S. current account deficits have remained at a low level of 2% since 2013.[1] Despite the slight improvement of external imbalance after the Great Recession, the United States still has the largest current account deficits in the world. Meanwhile, China has maintained a large amount of trade and current account surplus since the early 1990s. The large portion of its trade surplus was gained from the trade with the U.S.

[1]The current account deficits are smaller than the trade deficits after 2009 due to the high returns of U.S. oversea investments.



Data Source：World Development Indicators

Figure 1　Balance of Trade and Current Accounts in U.S. and China

Given the large trade deficit with China, it seems to be tempting for the U.S. government to fix current account deficits by reducing the imports from China. In fact, the Trump administration has raised tariffs by 10% to 25% against $250 billion imports from China, aiming to reduce the trade and current account deficits. However, a trade war by hiking up tariffs against China will not help the U.S. reduce its current deficits. On the contrary, the U.S. current account deficits are more likely to increase as trade protectionism reduces the competitiveness of U.S. exports. Moreover, the rising government deficits due to the massive tax cuts in the U.S. will increase demand for imports. We discuss below the economic fundamental reasons why the U.S. has been trapped in current account deficits for decades.

A macroeconomic identity of national accounts may help us profoundly understand the relationship among the current account, domestic savings, and investment. The expenditure approach to the national GDP (Y) could be broken down into consumption (C), investment (I), government spending (G), and net exports as shown below:

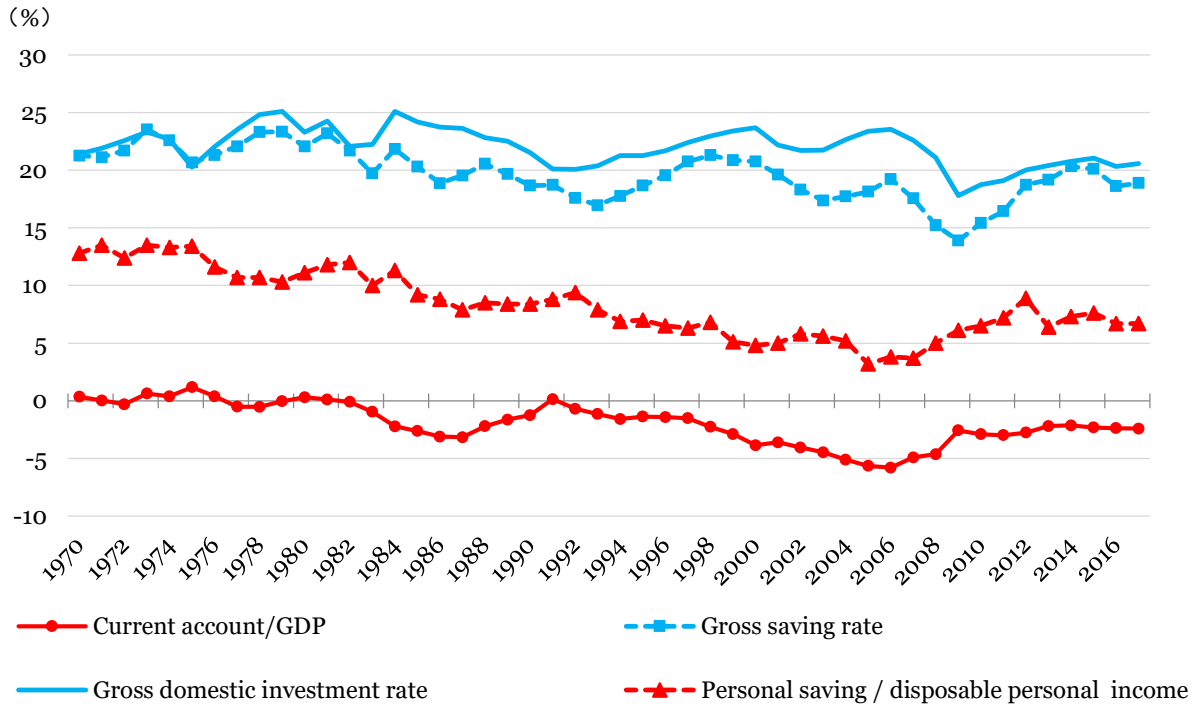
$$Y = C + I + G + X - M. \tag{1}$$

Assuming the net export is equal to the current account, we have the following:

$$\mathrm{CA} \equiv \mathrm{NX} = (\mathrm{Y} - \mathrm{T} - \mathrm{C}) + (\mathrm{T} - \mathrm{G}) - \mathrm{I} = \mathrm{S}_p + \mathrm{S}_g - \mathrm{I} = \mathrm{S} - \mathrm{I}. \quad (2)$$

Hence, the current account is equal to the gap between domestic saving and investment. A deficit in the current account simply means that the country needs to borrow from other countries by importing more than its exports when domestic output cannot support its consumption and investment demand. Saving and investment are determined not only by the current economic conditions but also by the expectation of future output. The balance of the current account is also an intertemporal decision. Furthermore, domestic saving could be broken down into private savings $\mathrm{S}_p \equiv \mathrm{Y} - \mathrm{T} - \mathrm{C}$ and government savings $\mathrm{S}_g \equiv (\mathrm{T} - \mathrm{G})$. This decomposition illustrates the two driving forces for long-term current account deficits in the U.S., namely the low saving rates and high government fiscal deficits.

The long-term current account deficits in the U.S. are largely driven by the gradual declining in domestic savings rates, as the gross investment rate has stayed stable over the years. Figure 2 shows that the U.S. gross domestic investment rate fluctuated from 17.8% to 25% during 1970 and 2017. It remained at a moderate level of 23.5% even when the current account deficits reached their peak in 2006. By contrast, the U.S. gross savings rate (1-Final Consumption/GDP) has been in a declining trend between the early 1970s and 2009. It dropped from a peak of 23.5% in 1973 to 19% in 1983 and gradually decreased to the lowest level of 13.9% in 2009, followed by a slow recovery to 18.9% in 2017. Hence, the gap between the gross investment rate and saving rate has been widening over the years since 1984, which is reflected by the deteriorating current account deficits. One important reason for the declining gross saving rate is the declining U.S. personal saving rates. The U.S. personal savings rates — personal savings as a percentage of their disposable income — declined all the way from a peak of 13.5% in 1973 to the lowest level of 3.2% in 2005, during which the current account deficits were enlarged from 0.6% of GDP to 5.6% of GDP. Although the personal savings rates recovered to 6.7% in 2017, it was still half of that in the 1970s.



Data Source: U.S. National Income and Production Table from U.S. Bureau of Economic Analysis

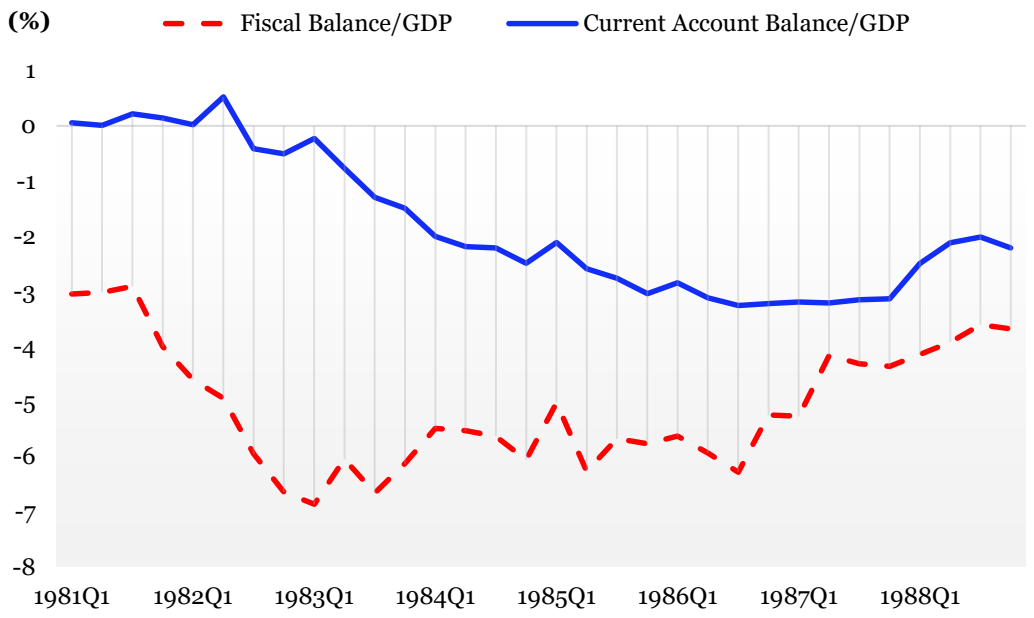
Figure 2 U.S. Current Account, Saving Rate, and Investment Rate

In addition to the decline in personal savings, the expansionary fiscal policy by the U.S. government was also responsible for the current account deficits in certain periods. The fiscal deficits can be viewed as negative government saving. Admittedly, the private sector might increase their savings to compensate for the decrease in government saving when Ricardian Equivalence holds, since the private sector believe the fiscal deficit needs to be paid in the future in the form of high tax (Barro 1974; Evans 1988). However, the increase of private saving may not fully or partially compensate for the decrease in government savings, which leads to a decline in national saving. In fact, tax cuts and increases in government spending generally stimulate domestic consumption and private investment, thereby enlarging the gap between saving and investment. This enlarged gap between saving and investment aggravates the shortage of capital supply for investment, resulting in the hike of interest rate and the appreciation of the U.S. dollar, which in turn promotes imports, weakens exports, and deteriorates the current account balance. The current account deficits caused by government deficits is usually referred to as the "Twin Deficits hypothesis" (Normandin 1999; Chinn 2005; Chinn and Ito 2008).

Presidents Ronald Reagan and George W. Bush have implemented large-scale tax cuts

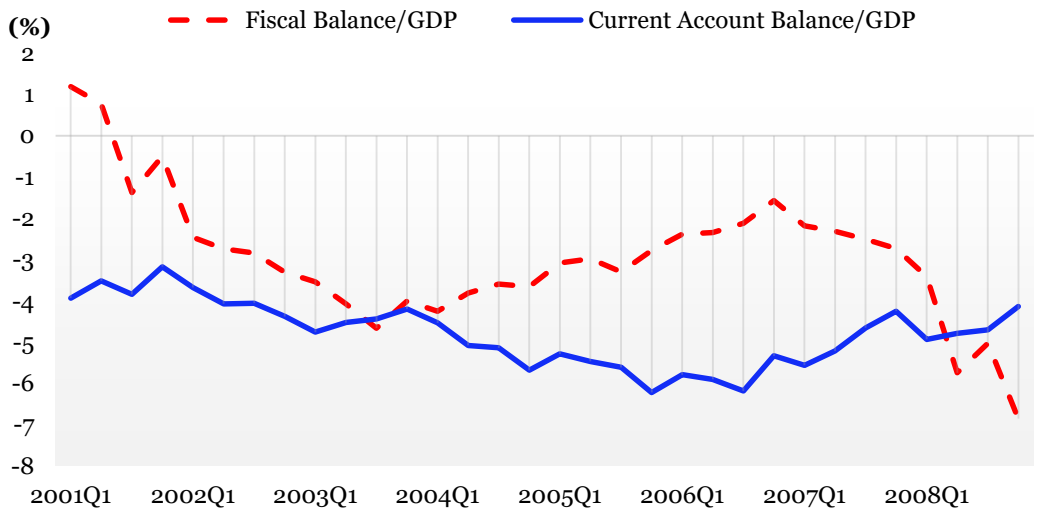
during their tenures in the 1980s and 2000s, respectively. Their policies resulted in the increase of the government deficits, the decrease of the national savings, and the increase in the current account deficits. Figures 3 and 4 illustrate the twin deficits during their tenures[2]. President Reagan acquiesced in the increase of government deficits and current account deficits when he vigorously implemented tax cuts. Figure 3 shows that the government deficits as the percentage of GDP increased from 3% to 6.9% during the first two years of President Reagan's tenure and remained at such a high level of 6% in the next three years. At the same time, the current account deteriorates from almost balanced to a deficit of 3% of GDP. During President Bush's tenure from 2001 to 2008, the U.S. government largely increased the expenditure on national security against terrorism, despite the large scale of tax cuts. This increase quickly turned the government surplus left by President Bill Clinton into a huge deficit of 4.5% of GDP in four years. The government deficits further deteriorated to 6.9% of GDP during Bush's second term of tenure due to the large national security expenditure on the Iraq War. It is noteworthy that 2001 to 2008 was also the period when the U.S. current account deficits increased at the fastest speed. Moreover, during the same period, China' s current account surplus quickly increased in an almost "mirror" symmetric way. Hence, it could be reasonable to say that the large U.S. government deficits caused by its national security expenditure on The War on Terror were partially financed by foreign capitals, especially capitals from China.

[2]The data on U.S. fiscal balance and current account balance is obtained from U.S. GDP and National Income and Product Account (NIPA) Tables, provided by U.S. Bureau of Economic Analysis). https://apps.bea.gov/iTable/iTable.cfm?reqid=19&step=3&isuri=1&1921=survey&1903=316#reqid=19&step=3&isuri=1&1921=survey&1903=316.



Data Source: U.S. National Income and Product Tables from the U.S. Bureau of Economic Analysis

Figure 3 Twin Deficits During Reagan's Tenure from 1981 to 1988



Data Source: U.S. National Income and Production Table from the U.S. Bureau of Economic Analysis

Figure 4 Twin Deficits During Bush's Tenure from 2001 to 2008

President Trump also implemented the policy of large-scale tax cuts. It could be reasonable to expect that the U.S. current account deficits will not shrink but rather continue to expand in the near future. Different from his predecessors including Presidents Reagan and Bush, President Trump also targeted on reducing the current account deficits when implementing expansionary fiscal policy. However, the reduction of the current account deficits with a large government deficit

increase can only be realized by reducing private investment or consumption, which hereby increases the private saving. Such a situation only occurred during the Great Recession. During the recession, despite the expansion of government expenditure, the consumption and investment remained weak, which reduced the imports and the current account deficits. In recent years, the U.S. economy has been recovering from the Great Recession, which means the consumption and investment are unlikely to fall, especially under the expansionary fiscal policies. According to the estimates of the U.S. Congressional Budget Office, the government budget deficits will increase from 3.5% of GDP in 2017 to 4.9% of GDP in 2021, thereby pushing up the current account deficits from 2.4% of GDP in 2007 to 3.6% of GDP in 2021.[3] According to this estimate, the current account deficits will increase by 50% in four years from 2017 to 2021. Given the current $20 trillion U.S. GDP, the current account deficits will increase to approximately $720 billion in 2021.

Besides the low domestic saving rate and the hikes in government deficits, the critical role of the U.S. dollar as global currency facilitates the U.S. to maintain its long-term current account deficits. As the Triffin dilemma described, using the U.S. dollar as the global currency requires the United States to provide extra cash to other countries through trade deficits. On the other hand, keeping long-term current account deficits will raise concerns about the U.S. capability of paying back the debt, which will cause the depreciation of U.S. dollars and threaten its role as the global currency. In order to maintain its role as a global currency, the U.S. dollar must not depreciate significantly, which requires the U.S. to keep the current account balance. Such conflicts between domestic and international interests are referred to as the "Triffin dilemma" (Triffin 1960).

However, the long-term current account deficit of the U.S. has not spurred the worries of foreign countries about its external debt, nor threatened the central place of the dollar in the global financial system. The irreplaceable role of the U.S. dollar in today's financial system can be directly reflected by the composition of official foreign reserves in the world. According to the foreign exchange reserve assets data provided by the International Monetary Fund, the global official foreign exchange reserve reached $11.4 trillion in the third quarter of 2018, of which U.S. dollar assets accounted for 61.94%, Euro accounted for 20.48%, while the Japanese yen, pounds sterling, Canadian dollar, and Chinese Renminbi only accounted for 4.98%, 4.49%, 1.95%, and

[3]The estimates are obtained from the report by U.S. Congressional Budget Office (CBO). See U.S. CBO (2018) for detail.

1.8%, respectively.[4]

Therefore, the U.S. has to provide cash to other countries by running trade deficits as long as the U.S. dollars is still the major global currency for foreign reserves and international settlement. Furthermore, as one of the most popular safe assets, the U.S. bonds, especially the U.S. Treasury Bonds, have become more important in the era of financial globalization. Even the Great Recession from 2007 to 2009 was not able to weaken the role of the U.S. dollar as a global currency. Other countries still pursued massive dollar assets as the most important safe asset regardless of the near-zero yields of U.S. bonds after the Fed's quantitative easing policy.

In sum, given the structural factors including the low saving rates, high fiscal deficits, and the global demand for U.S. dollars, the U.S. current account deficits are less likely to be reduced by simply increasing tariffs on imports from China without confronting the aforementioned fundamental causes. In fact, the trade war with China is more likely to deteriorate the U.S. current account deficits for the following reasons.

First, the U.S. economy is currently booming, implying a relatively strong import demand. Although the U.S. will reduce its imports from China due to the tariff hikes on imports from China, it is also likely to increase the imports from other countries. Hence, U.S. imports are unlikely to decline. Second, China adopted the retaliation policy by increasing tariffs on the imports from the U.S., which puts pressure on U.S. exports. Moreover, the U.S.–China trade conflicts have threatened China's economic growth outlook and weakened its demand for U.S. products. Additionally, the U.S. government's unilateralism and trade protectionism contributed to the appreciation of the U.S. dollar, which may increase imports and decrease exports and thus result in the rising of the trade deficits.

The newly released U.S. trade data have shown the widening trade deficits, which thwart President Trump's ambition to cut the trade deficits. According to the latest statistics from U.S. Bureau of Economic Analysis, the total U.S. trade deficits in goods and services reached $621 billion in 2018, which was 12.5% higher than the number in 2017. Moreover, the deficits in goods trade exceeded $891 billion, reaching a historical record in the past decade, thereby signaling President Trump's failure in achieving his goal of reducing trade deficits through trade protectionism and the trade war against China.

[4]The data about currency composition of official foreign exchange reserve (COFER) is obtained from IMF's latest update on Jan 08, 2019 on http://data.imf.org/?sk=E6A5F467-C14B-4AA8-9F6D-5A09EC4E62A4.

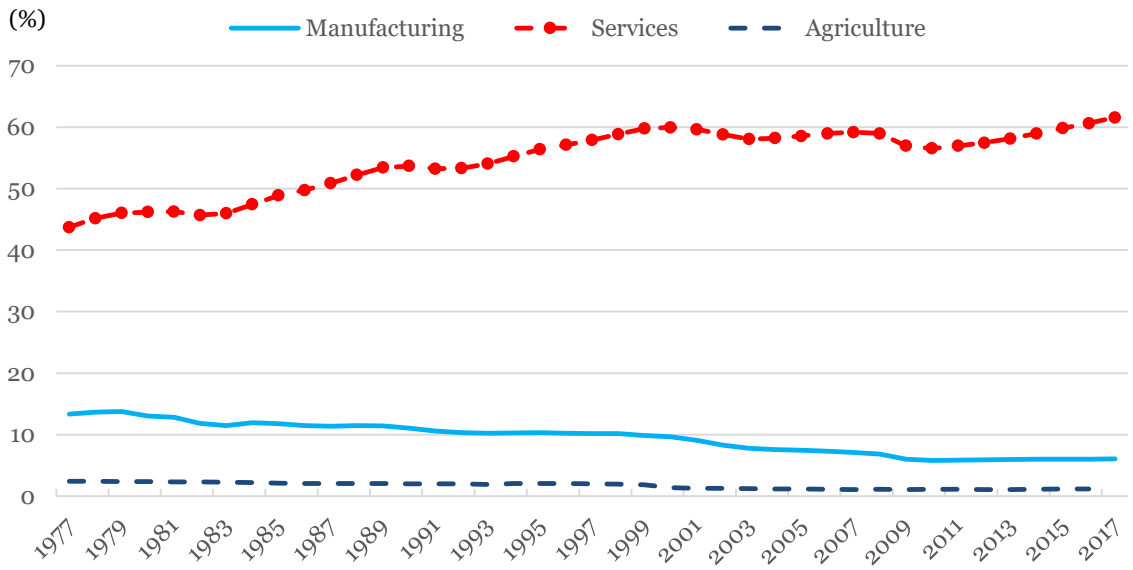
III. Promote the Resurgence of U.S. Manufacturing

President Trump called for "America First" and "Make America Great Again" during the presidential inauguration on January 20, 2017. One of his strategical targets is to revive the U.S. manufacturing sector by adopting protectionist policies and tax cuts. The former White House chief strategist Steve Bannon said that President Trump's strategy is to make the U.S.–China trade war "unprecedentedly large" and "unbearably painful" to Beijing in his exclusive interview with the South China Morning Post in Hong Kong on September 22, 2018. He further stated that the aim of the trade war was not just to force China to give up its "unfair trade practices", but the ultimate goal was to "re-industrialize America", given that manufacturing was the core of a nation's power.[5] However, the weakening of American manufacturing can hardly be attributed to the import competition from China. In fact, it is the structural transformation of the U.S. economy and the globalization of the world economy led to the shrink of U.S. manufacturing. Kehoe, Ruhl, and Steinberg (2018) find that only 15.1% of the decline in goods-sector employment from 1992 to 2012 stems from U.S. trade deficits; most of the decline is due to differential productivity growth between the goods and service sectors. Thus, it is difficult to promote the resurgence of U.S. manufacturing by simply increasing the import tariffs and reducing the corporate tax rate.

First of all, the decline of the importance of the U.S. manufacturing in the economy is not a short-term phenomenon, but a gradual process of structural transformation from a manufacturing economy to a service economy, along with the gradual increase of per capita income. The proportion of manufacturing workers in the total U.S. population has been declining since World War II, which makes the current economic structure different from the years when President Trump was young. Figure 5 plots the time series of the sectoral employment share in the working age population. The employment share of the service sector has been steadily increasing over the past 40 years, accompanied by the declining share of the manufacturing sector. Meanwhile, the proportion of agriculture employment remained at a relatively low level of approximately 2%. The structural transformation from manufacturing to services was mainly driven by technological advancements. Specifically, the rapid development of computers and automation technologies reduces the labor requirement in manufacturing for the same scale of output. According to the U.S.

[5]Sarah Gong. 2018. "'Trump won't back down': US president plans to make trade war unbearable for China and bigger than ever, Steve Bannon says." South China Morning Post, September 29. https://www.scmp.com/news/china/diplomacy/article/2165185/trump-wont-back-down-us-president-plans-make-trade-war

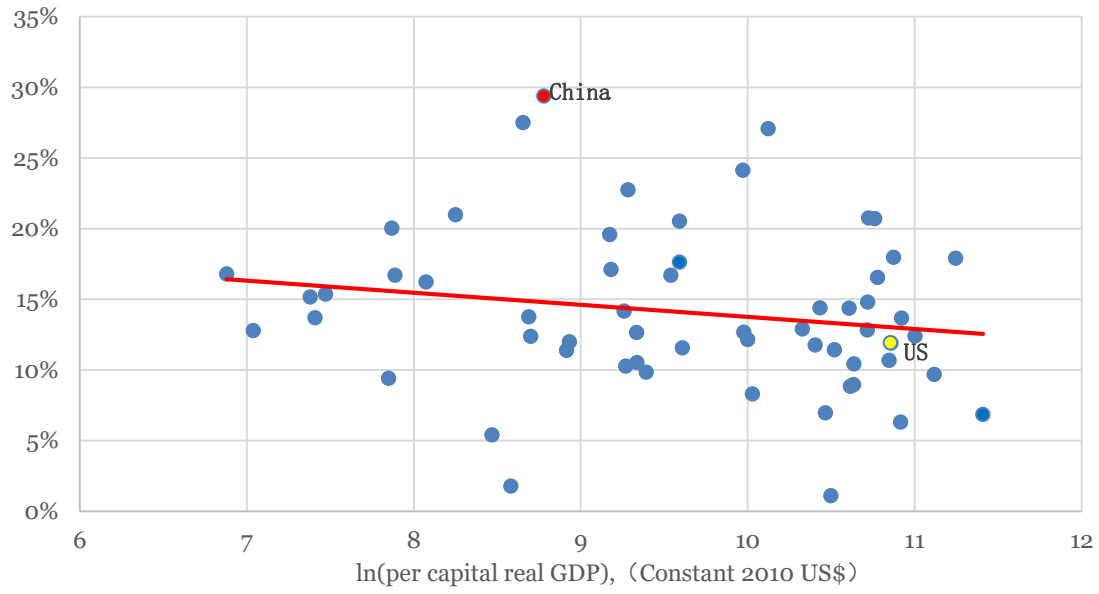
Bureau of Labor Statistics, for the past two decades, the real manufacturing output has increased by 60% despite a decrease of 30% of the manufacturing employment. The increase in the real output of U.S. manufacturing was mainly attributed to technological advancements, which led to a 125% increase in manufacturing production per capita. In the era of the 21st century, artificial intelligence and robotics will be widely applied to the manufacturing industry, implying the replacement of more jobs and a further decrease in manufacturing employment shares.



Data Source： U.S. Federal Reserve Banks of ST. Louis

Figure 5 Sectoral Employment Shares in the United States

The structural transformation of the industrial structure, from manufacturing to services along with economic development is not unique to the U.S. Figure 6 shows the relationship between the value-added of manufacturing as a percentage to GDP and the per capita GDP of the top 60 economies in the world. It indicates that the high-income countries usually have lower manufacturing share in its GDP. The U.S. is very close to the linear fitted line in the scatterplot, indicating that it is not a special case, but rather fits in the general economic rules. Meanwhile, China's manufacturing sector is relatively high for the same level of per capita GDP, indicating that it is indeed "the factory of the world". The main reason for China's high share of manufacturing is that it has the comparative advantage in labor-intensive manufacturing industries and has attracted massive multinational productions from other countries.



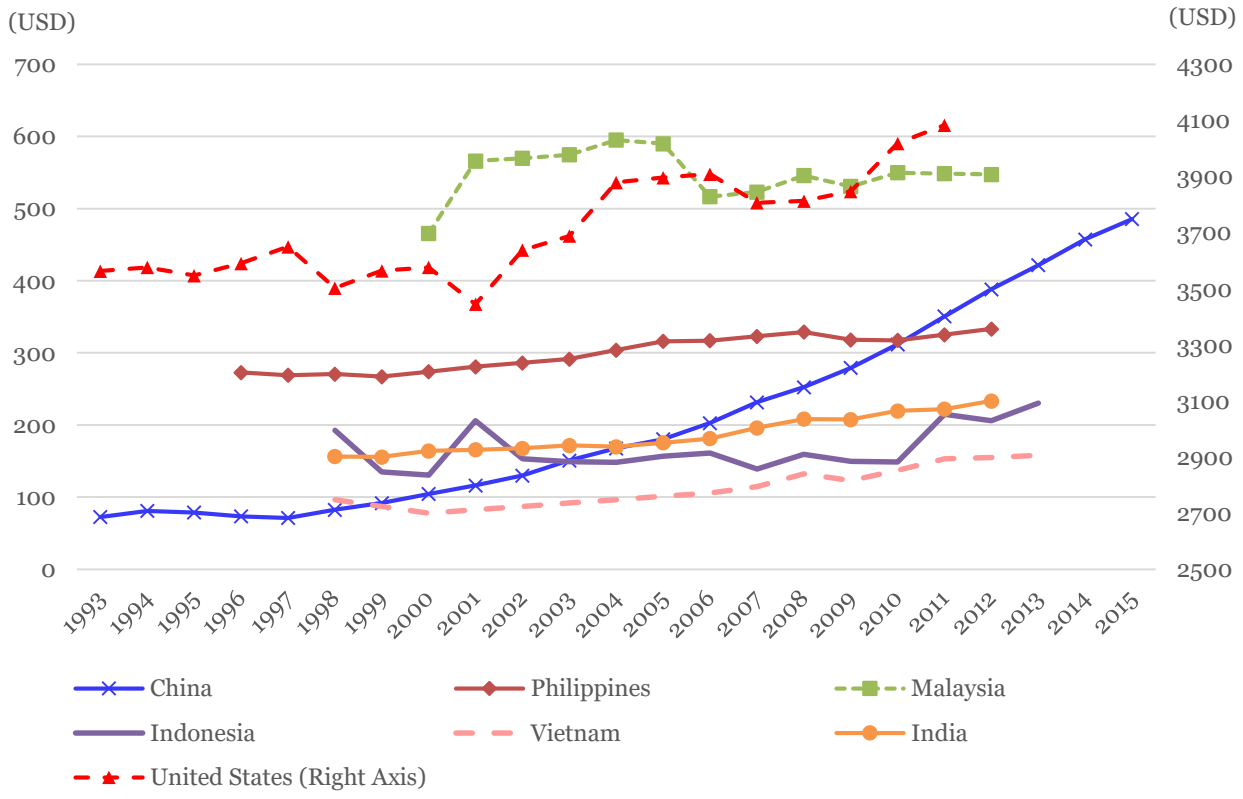
Data Source：World Bank

Figure 6 Value-Added Share of Manufacturing and Income Level in 2015

Second, the labor costs in the U.S. manufacturing sector are much higher than those in developing countries. Thus, the U.S. does not have comparative advantages in labor-intensive industries and products. Figure 7 shows that the labor cost in the U.S. manufacturing sector is much higher than that in the East-Asian developing countries based on the UNIDO statistics. In 2011, the labor cost of manufacturing in the U.S. was $4,083 per month in constant dollar of 2007. Meanwhile, China's manufacturing labor cost was one-tenth that of the U.S. in 2011. The labor costs in other developing countries in Eastern Asia, such as the Philippines, Malaysia, Indonesia, Vietnam, and India, were 8%, 13%, 5%, 4%, and 5% that of the United States, respectively. Moreover, this pattern has not changed significantly over the past decade, indicating that the Eastern Asian countries in comparison with the U.S., have a prominent advantage in labor costs. Thus, consumers and firms in the U.S. would import labor-intensive products from other developing countries, rather than produce them in the U.S. when the imported price for Chinese goods increased due to the high tariff. In addition, even if multinational companies would like to move their factories out of China due to the increased U.S. tariffs on imports from China, they would rather transfer production to other developing countries than back to the U.S. Therefore, the U.S.–China bilateral tariff war is unlikely to bring the manufacturing jobs back to the U.S.

Moreover, economic globalization allows the U.S. to utilize resources and labor globally. For instance, the country can benefit from exporting agricultural products and capital-intensive

products and importing labor-intensive intermediate inputs and consumption goods (Feenstra and Weinstein 2017). U.S. multinational companies can also offshore their labor-intensive tasks to developing countries with low labor costs and sell their products to the world market (Ramondo and Rodríguez-Clare 2013). In this sense, globalization indeed caused U.S. manufacturing job loss in less competitive industries and firms (Autor, Dorn, and Hanson 2013). However, globalization has also created jobs in the U.S. exporting sectors, provided cheap products to consumers and companies, and generated profits for U.S. multinationals (Feenstra and Sasahara 2018).



Data Source：United Nations Industrial Development Organization

Figure 7 Monthly Real Average Wage in Manufacturing Sector Across Countries (Constant 2007 USD)

Third, the Trump administration's unilateral trade protectionism could be counterproductive. Instead of promoting the resurgence of American manufacturing, it is likely to weaken the competitiveness of U.S. manufacturing. Imposing tariffs on U.S. imports will not only hurt the U.S. consumers but also weaken the competitiveness of U.S. manufacturing firms, as the prices of intermediate inputs rise. A recent study by Amiti, Redding, and Weinstein (2019) affirms

that the imposed high tariffs on U.S. imports have been completely passed through to U.S. consumers and firms through the supply chain linkage, which caused a $1.4 billion loss of welfare per month. The pass-through of tariff on domestic prices has been also confirmed by Fajgelbaum et.al. (2019). In consistency with the academic finding, General Motors (GM), the largest American automobile manufacturer, has also indicated that it plans to close three domestic factories in the U.S. partially because of the increase in GM's production costs due to the higher tariff on steel and aluminum imports.

Moreover, the tariff war initiated by the U.S. will inevitably lead to retaliation by its trading partners, which will hurt U.S. exports and also drive U.S. companies to move their production out of the U.S. To avoid the negative effect of the high tariffs set by their exporting destination countries, U.S. multinationals would choose to invest and produce directly in foreign countries.

A well-known example is the case of American Harley-Davidson (referred to as "Harley" thereafter), a Wisconsin-based company renowned worldwide for its heavy-duty motorcycles. Founded in 1903, it is a century-old American brand that has now been marketed in more than 200 countries. President Trump was also very proud of Harley and praised it as a "great American company". However, in June 2018, Harley announced that it would relocate the production outside the U.S. There were two main reasons why Harley wanted to move the production line overseas. First, the steel and aluminum trade war increased the cost of raw materials. Harley reported that its cost for purchasing steel had surged by 75% due to the high tariffs imposed on steel imports in April 2018. Second, the European Union would take retaliation to the U.S. trade war and announced that they would impose additional tariffs on their imports of motorcycles, bourbon whiskey, and orange juice from the U.S. if the U.S. eventually increased the tariff for auto imports. Harley said that the retaliatory tariffs would increase the average price of its motorcycles sold to the E.U. by $ 2,200 per vehicle. Therefore, the company had to expand production lines outside the U.S. to avoid the possible hikes of E.U. tariffs.

Ford Motor also faces a similar challenge. Due to the escalating trade conflicts between China and the U.S., China's tariff on U.S. auto imports has increased by 40%. Ford Motor has announced that it would expand its production in China, especially the Lincoln series, which accounts for over half of its total 80,000 cars sold in China in 2017. China's high retaliatory tariffs on U.S. cars would make American-made cars less competitive in China. Instead, manufacturing cars in China can help the company avoid China's tariffs on importing. Hence, Ford Motor is

forced to increase its local production in China to keep its market share there.

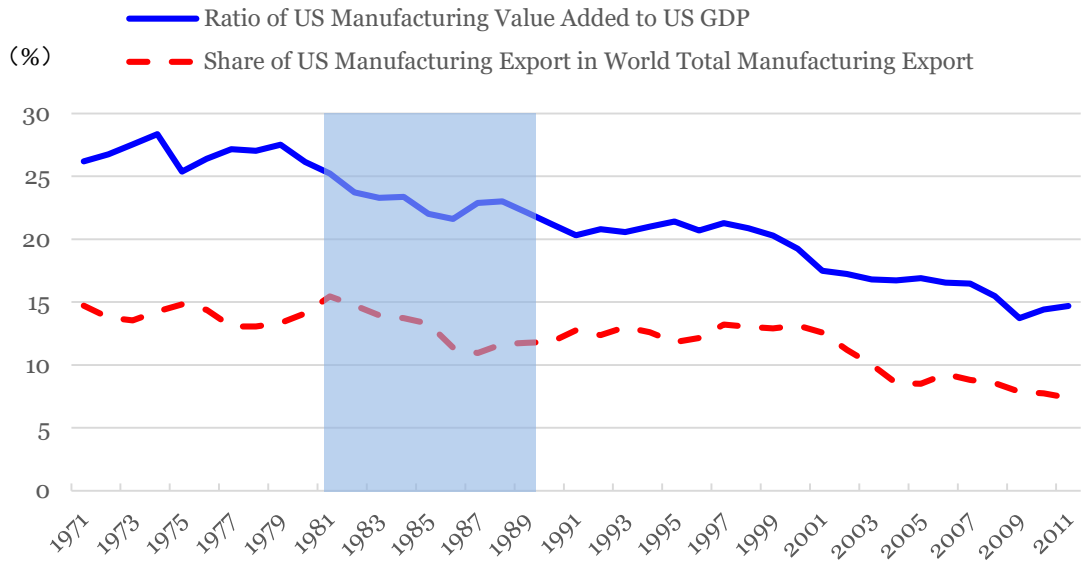
Finally, the uncertainty of the U.S. trade policies has also prevented the U.S. from attracting foreign direct investment. In September 2018, Jack Ma, the co-founder and executive chairman of the Alibaba Group, said in an exclusive interview with Xinhua News Agency that fulfilling his previous promise of creating 1 million jobs for the U.S. under current circumstances was difficult because the commitment was built on the friendly cooperation between China and the U.S.[6]

After analyzing the negative effect of U.S. protectionism policy, we continue to discuss the limited effect of the U.S. tax cuts on promoting the resurgence of U.S. manufacturing. In short, tax reform cannot reverse the declining trend of manufacturing in the U.S. economy. The Trump administration has conducted a large-scale tax reduction on domestic enterprises in addition to imposing high tariffs on U.S. imports. Its tax reduction policy mainly includes three aspects: (1) reducing the maximum corporate income tax rate from 35% to 21%; (2) adopting the Territorial tax system. In the future, U.S. companies only need to pay taxes in the countries where profits are generated. Hence, the part of profits earned overseas will be exempted from U.S. income taxes. The converting from the previous worldwide system of taxation to the Territorial tax system will eliminate the distortionary incentives for U.S. companies to keep their earnings overseas and encourage U.S. companies to repatriate overseas profits and invest domestically; and (3) implementation of one-time taxation on pre-2018 accrued profits of foreign affiliates of U.S. companies at much lower tax rates. In detail, the tax rate for cash profits is 15.5%, and the rate for non-cash assets is 8%.

Although it may take some time to see the effect of Trump's tax cuts on U.S. manufacturing competitiveness, we can refer to the tax cuts during President Reagan's era. President Reagan reduced the top corporate income tax rate from 46% to 33%. He also simplified the five-bracket income tax code to a four-bracket code. Despite the significant cut in the tax rate, U.S. manufacturing gradually shrank during the Reagan era. Figure 5 exhibits that the share of manufacturing employment in the total working-age population fell from 13% to 11% from 1981 to 1989. Meanwhile, the share of value-added in manufacturing to the total GDP decreased from 25% to 22% and the share of U.S. manufacturing exports in the total world manufacturing export decreased from 15% to 12% (Figure 8). Hence, Reagan's tax cuts failed to reverse the trend that

[6]Liangyu. 2018. "Trade should be propeller of peace: Jack Ma", *Xinhuanet*, September 20. http://www.xinhuanet.com/english/2018-09/20/c_137480016.htm.

the importance of U.S. manufacturing was declining in the U.S. economy.



Data Source：NBER-CES, WITS, and BEA

Figure 8 Importance of U.S. Manufacturing

The highlights of Trump's taxation reform include cutting tax rates and changing the treatment of overseas profits and income of U.S. multinational firms and citizens. Before the taxation reform, the U.S. adopted the worldwide taxation system, which was complex and outdated. Combined with the highest tax corporate income tax rate, the U.S. taxation system kept its firms from bringing profits back home.[7] By switching to Territory taxation, the U.S. government may be able to encourage U.S. multinational firms to repatriate their overseas profits in the short term.

The Tax Cuts and Jobs Act (TCJA), signed into law by President Trump on December 22, 2017, significantly simplified the taxation on foreign earnings of U.S. multinational companies. It enacted the U.S. shift from a worldwide corporate tax system to a territorial tax system, which means that U.S.-based multinational corporations must now only pay income taxes to the U.S. government based on their profits generated in the U.S. and that they only need to pay taxes for their overseas profits in the countries where the profits are generated. To further stimulate the

[7]The U.S. used to levy taxes on profits of all U.S.-based corporations and income of all U.S. citizens once these incomes were brought back home, no matter where they were earned. Although the U.S. government allows for the deduction of the paid taxes in foreign countries from the tax base to avoid double taxation due to the relatively high cooperate tax rates, the U.S. companies and citizens always had to pay additional taxes once they brought the incomes or profits back to the U.S. Hence, the U.S. companies intended to park the profit of their foreign affiliates offshore to defer the income tax. Some of them even thought of inverting or being acquired by foreign companies.

repatriation of offshore profits, the new tax code also requires all U.S. shareholders to pay the tax to the U.S. government for their accumulative retained foreign incomes back to 1987 without deference but at a lower transitional tax rate. Instead of the new standard corporate tax rate of 21%, or the individual income tax rates topped at 37%, a lower transitional tax rate applies to those retained overseas profits and incomes after applicable deductions (15.5% for cash and equivalents and 8% for non-liquid assets)[8].

This tax policy encouraged U.S. multinational firms to repatriate their retained offshore profits in the short-term. According to statistics from the U.S. Census Bureau, U.S. multinationals repatriated one-third of their overseas income as dividends and parked the remaining two-thirds offshore as retained earnings of foreign subsidiaries from 2016 to 2017. In the first quarter of 2018, U.S.-based corporations had generated a total offshore income of $128.1 billion, but they had repatriated $294 billion as dividends. In the second quarter, the offshore incomes totaled $132.9 billion, and the repatriated dividends were $183.7 billion, making U.S. corporations' reinvestment of retained earnings in the overseas negative in the first half of the year 2018, indicating that U.S. multinationals have repatriated some of their historically retained earnings to the U.S. However, the repatriation dropped significantly in the second quarter of 2018 ($183.7 billion) compared with the first quarter ($294.9 billion) and further dropped to $92.7 billion in the third quarter, indicating that the effect of tax reform on the flow of capital is likely to be temporary. Thus it cannot generate a significant push to revive the U.S. manufacturing sector.[9]

In sum, it is not the import competition from China, nor the unfair trade practices, but the economic law that impedes the Trump administration from rebuilding the manufacturing sector in the U.S. Technology advancement and the economy of scale reduced the labor input in manufacturing. Furthermore, the decreasing cost in trade and production fragmentation allows U.S. corporations to build global value chains by offshoring labor-intensive production to developing countries while retaining only the most profitable R&D designs and sales activities in the U.S. Although the final products can no longer be tagged as "Made in America", the U.S. still controls

[8]The tax policies are specified in "Section 965 Transition Tax." https://www.irs.gov/businesses/section-965-transition-tax and "Questions and Answers about Reporting Related to Section 965 on 2017 Tax Returns." https://www.irs.gov/newsroom/questions-and-answers-about-reporting-related-to-section-965-on-2017-tax-returns

[9]The data on repatriation is obtained from BEA U.S. International Transactions. Released in December 2018. (Table 4 U.S. International Transactions in Primary Income; accessed March 21, 2019). https://www.bea.gov/data/intl-trade-investment/international-transactions.

the global value chain of their products. By contrast, setting trade barriers like high tariffs to protect the industries, products, and production activities in which the U.S. does not have comparative advantages will be counterproductive and further weaken the competitiveness of the U.S. manufacturing sectors.

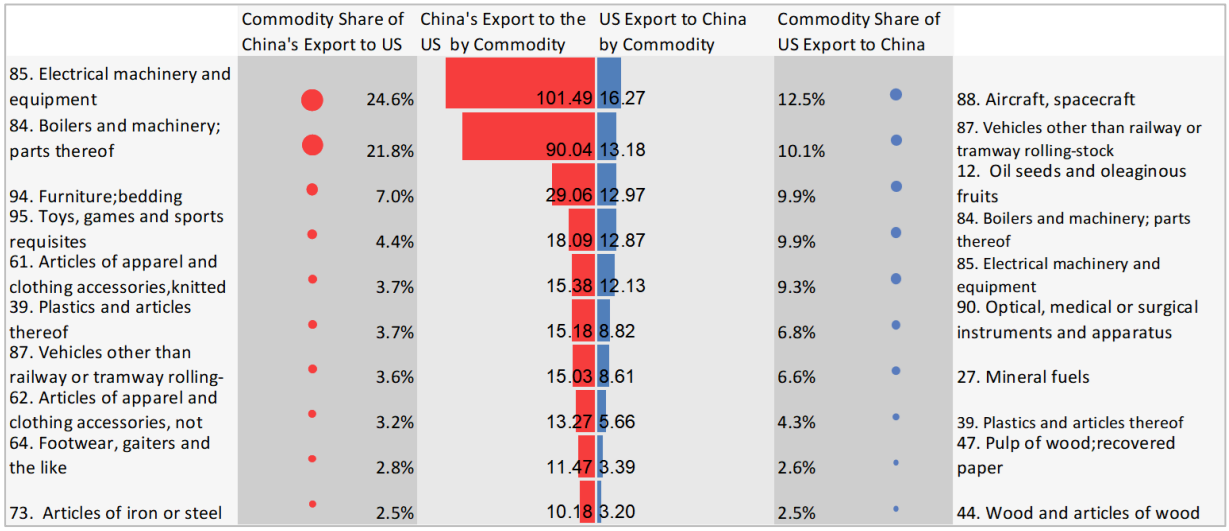
IV. Curb China's High-Tech Manufacturing

In early March 2018, the office of the United States Trade Representative (USTR) issued the 301-investigation report on China's intellectual property rights protection, accusing the Chinese government of forcing foreign-funded enterprises to transfer technology and intellectual property rights, which caused a loss of $50 billion annually to the U.S. On the basis of their investigation, the USTR recommended the responsive actions to China's practices, consisting of three major measures: (1) imposing an additional 25 percent tariff on approximately $50 billion of imports from China that are strategically important to and benefit from the "Made in China 2025" program and other Chinese industrial policies; (2) continuing to pursue dispute settlement at the World Trade Organization (WTO) to address China's discriminatory licensing practices; and (3) implementing new investment restrictions on Chinese investment in high-tech industries in the U.S. such as semiconductors and 5G network. The 25% tariff hike on the $50 billion imports from China has taken into effect in July and August 2018. Moreover, as a response to China's retaliation, the U.S. further imposed additional tariffs on the imports from China worth $200 billion at the rate of 10%, which would rise to 25% if the two countries do not reach a trade agreement. In this large-scale tariff war, the U.S. mainly targets China's high-end manufacturing, especially the industries involved in the "Made in China 2025" program.

Targeting China's high-tech manufacturing industries reflects the concerns of the U.S. political and economic elites about the continuously narrowing technology gap between the U.S. and China. As early as in 2004, Paul Samuelson, one of the most influential economists in the 20th century, wrote that if China continues to accelerate its technological advances in industries such as high-tech manufacturing, in which the U.S. traditionally has comparative advantages, China would no longer be selling shirts to the U.S. in exchange for planes. Instead, it would sell planes in exchange for planes from the U.S. Thus, China's technology advance would weaken U.S. comparative advantages in high-tech manufacturing and deteriorate the term of trade for the U.S., which will finally hurt the U.S. economy (Samuelson 2014).

The worries on the rising competition from China did not come from nowhere. According

to China Customs statistics, China's exports of mechanical and electrical products reached 8.95 trillion yuan in 2017, an increase of 12.1%, accounting for 58.4% of China's total export value. Among them, the exports of automobiles, computers, and mobile phones increased by 27.2%, 16.6%, and 11.3%, respectively. In the same period, the total export of traditional labor-intensive products was 3.08 trillion yuan, an increase of 6.9%, accounting for only 20.1% of the total export value. In more detail, Figure 9 shows the commodity composition of bilateral trade between China and the U.S. In 2017, China's goods exports to the U.S. were $413.1 billion, and the export share of electrical machinery and machinery was 46%. Traditional labor-intensive products including clothing, furniture, toys, and footwear became less important for Chinese exports. By contrast, the total U.S. goods exports to China were $130.3 billion in 2017, with three old major commodities: aircraft, automobiles, and soybeans, which together account for one-third of the total U.S. exports to China. Motor electrical equipment, mechanical equipment, and optical medical equipment together take another quarter of the total U.S. export to China. The commodity composition of bilateral trade between the U.S. and China indicates that the trade between the two countries started switching from the inter-industry trade driven by comparative advantages due to endowment difference to intra-industry trade driven by the economy of scale and technological advances, which implies that the competition between Chinese and American products within the same industry will become increasingly fiercer than before.



Data Source: China Customs and U.S. Customs

Figure 9 US–China Bilateral Trade by Commodities in 2017

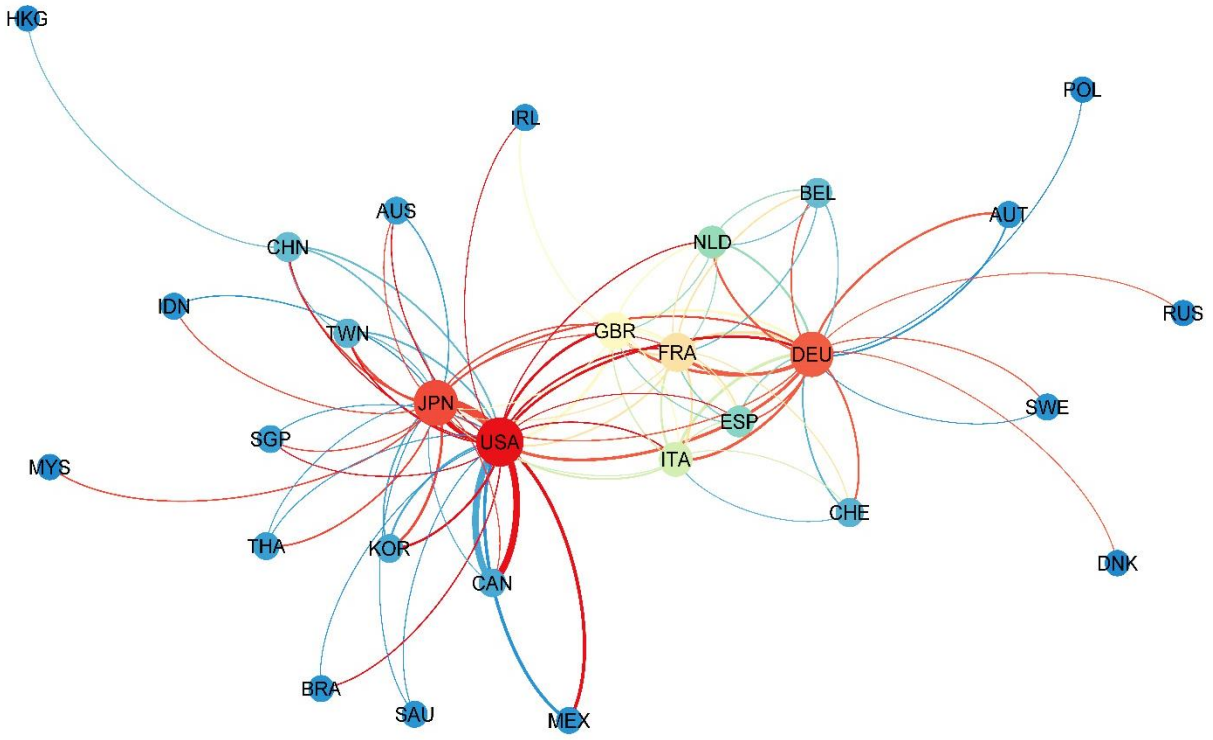
In the past two decades, China's scientific research inputs and outputs have been greatly improved, narrowing its technology gap with developed countries such as the U.S. The rapid technological progress has increased the competitiveness of Chinese products and companies in the international market. In the global market of communications network equipment, Huawei has surpassed Nokia and Ericsson and has become the world's largest manufacturer of communication network equipment. It is now rivaling with Samsung and Qualcomm as the three major designers of the 5G mobile communication system. Da-Jiang Innovations (DJI), a startup founded in 2006, has grown to become the global leader in the unmanned aerial vehicles (UAV or drones) market, taking more than half of the market share in North America. China's achievements in infrastructure construction attract worldwide attention as well, with its high-speed rail (HSR) as a business card for manufacturing in China. Moreover, Alibaba and Tennent WeChat are rapidly bringing China into a cashless society. In the field of mobile payments, China's pace is undoubtedly faster than any developed country in the world.

Facing the challenges from China in economic scale and technological progress, seeking solutions to maintain its technological advantages is crucial for the U.S. However, it will be unlikely for the U.S. to succeed in achieving the goal of curbing China's high-tech manufacturing industries and technological progress by engaging the trade war.

First, China's high-tech manufacturing industries are closely linked to the global supply chain. The U.S. tariffs on imports from China will be distributed across the entire supply chain; thus, foreign-owned firms in China and firms in other countries along the supply chain will share the cost of the U.S. import tariff hikes.

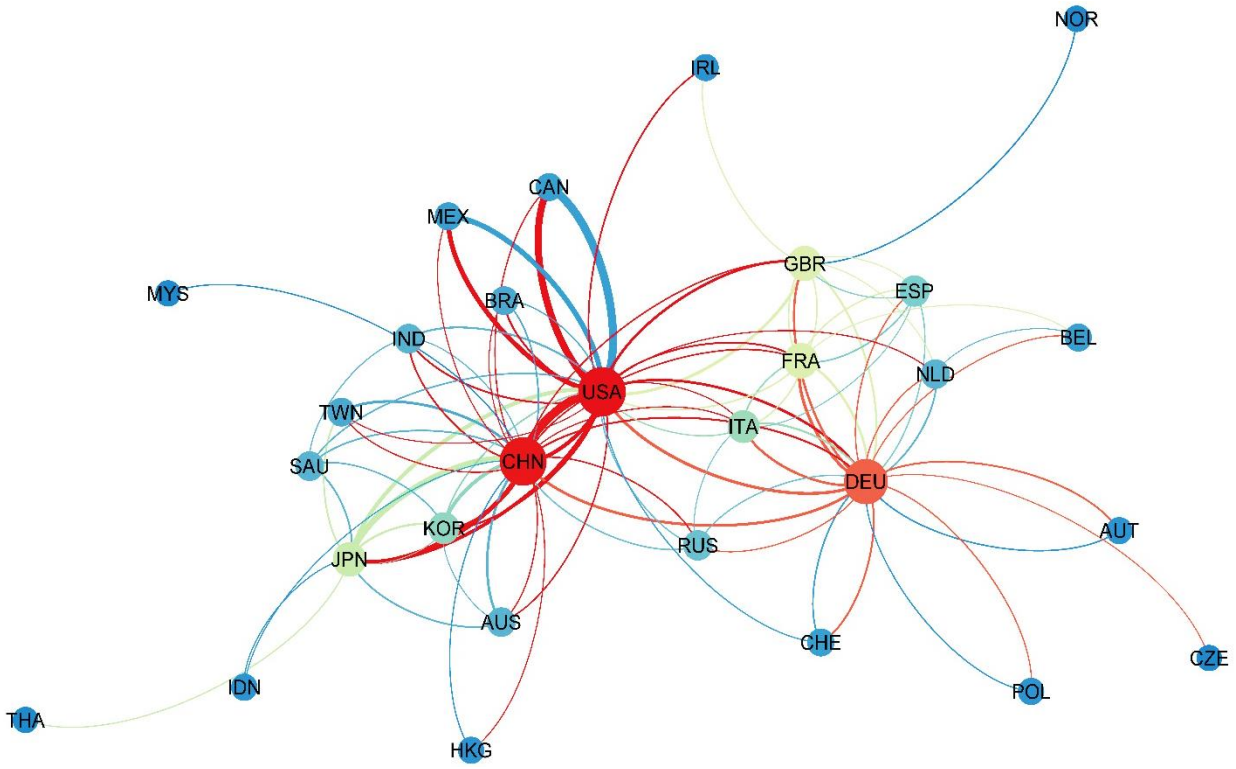
On the basis of the data on domestic value-added embodied in gross exports provided by the OECD-WTO TiVA database, we visualized the geographic distribution of global value chain for 1995 and 2011 in Figures 10 and 11, respectively. The global value chain is mainly composed of three major regional networks, namely, North America, Europe, and Asia-Pacific. Moreover, within each regional network, the periphery countries are connected by their regional hub countries. Moreover, the North American value chain is mainly composed of the U.S., Canada, and Mexico, and the European value chain mainly includes Germany, France, Britain, Italy, Spain, and Belgium. Furthermore, the Asia-Pacific value chain covers Japan, China, South Korea, Australia, Singapore, Hong Kong, and Taiwan. This pattern did not change significantly from 1995 to 2011. However, the most significant change from 1995 to 2011 was that China replaced Japan as the hub of the

Asia-Pacific supply chain. In addition, the Asia-Pacific and North American value chains are more closely linked to each other than to the European value chain. The main reason is that the Asia-Pacific countries and the U.S. are dependent on each other and are concentrated on different tasks in the value chain, while the European value chain is relatively independent and complete. Specifically, China mainly focuses on manufacturing and the U.S. is the most important R&D center and market. China has now occupied an important place in the global value chain and is very close to other countries. The tariff war between China and the U.S. will also be transmitted to firms in other countries through the global value chain.



Data Source: Organization of Economic Cooperation and Development (OECD-TiVA)

Figure 10 Geographic Distribution of Global Value Chain in 1995



Data Source: Organization of Economic Cooperation and Development (OECD–TiVA)

Figure 11 Geographic Distribution of Global Value Chain in 2011

Sheng and Zhao (2019) estimate China's export loss due to U.S. tariff hikes on $250 billion imports from China by using the simple demand elasticity method with the assumption of complete pass-through of the tariff to consumer prices. Their calculation suggests that China's export loss caused by the 25% tariff hike on the $50 billion imports and the 10% tariff hike on $200 billion imports were $13.4 billion and $21.5 billion, respectively. Moreover, foreign-owned firms and joint ventures in China accounted for 55% and 44% of the total export losses of the two waves of the U.S. tariff hikes, respectively. The main reason for the relatively large damage to foreign firms in the tariff war was that those firms usually concentrated on high-tech manufacturing industries. According to the statistics from China's Ministry of Commerce, as of 2015, the main sources of foreign direct investment to China include Hong Kong, the British Virgin Islands, Japan, Singapore, the U.S., South Korea, and Taiwan. Thus, multinationals located in China but owned by other countries including the U.S. also bear the cost of the tariff war between the U.S. and China.

The escalation of U.S.–China trade conflicts and the associated uncertainty on trade policy have driven multinational companies to consider shifting their production out of China to other developing countries. For products assembled in China but sold to the U.S., multinational

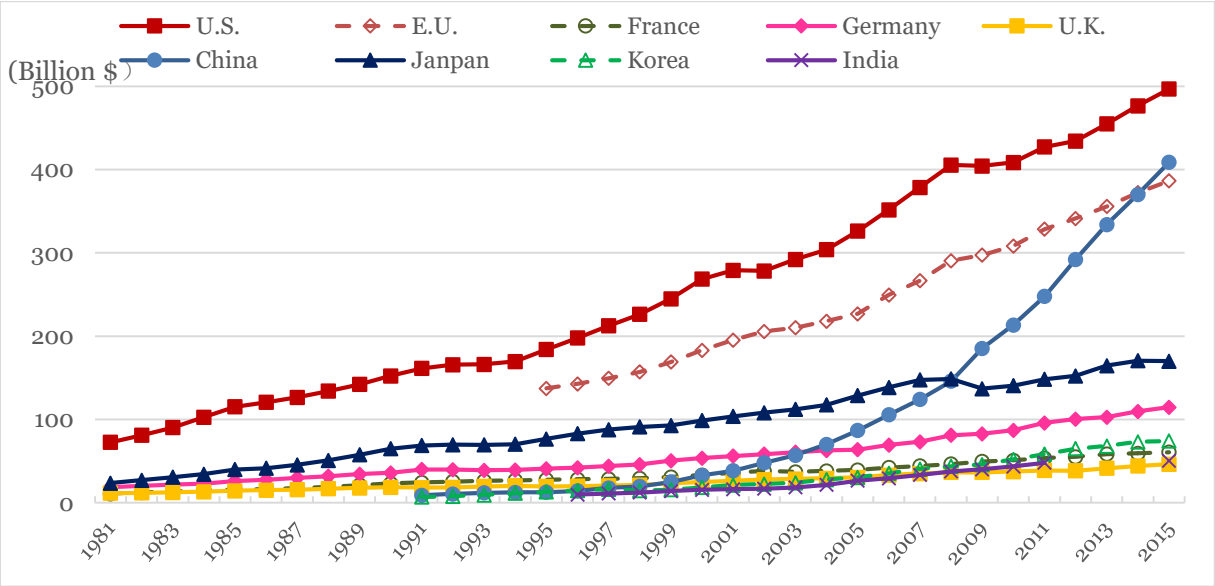
companies can reallocate the final assembly process to other countries to avoid U.S. tariffs on Chinese exports. However, many multinational companies may choose to stay if their major market is not the U.S., as long as the Chinese government maintains its policy of treating foreign investors equally. China has more advantages in infrastructure, skilled workers, and intermediate varieties compared with many developing countries such as India, Vietnam, and Thailand. Moreover, China could be the largest single market for many products, such as automobiles. Given the transportation costs of exporting to China from other countries where the goods are produced, it is more cost-effective to produce and sell directly in China. For high-tech manufacturing, developed countries mainly focus on R&D and design, and they do not have the capacity for large-scale production. They also need high-quality manufacturers to ensure product quality. Compared with other East Asian developing countries, Chinese manufacturers have advantages that cannot be matched in terms of large-scale production with low defective rates.

Second, restricting China's investment in sensitive industries in the U.S. may have little impact on technology transfer because China's current high-tech investments in the U.S. are very limited, and the most advanced technologies in the U.S. have never been open to Chinese investors for purchase. Instead, stopping the supply of critical components, such as chips, which they did in the sanction of ZTE, could be far more threatening to China's high-end manufacturing. This practice of cutting off the supply chain could make ZTE collapse immediately, but such practice would also cause great damage to U.S. companies producing chips. Given the fact that chip manufacturing is one of the core industries of high-tech manufacturing in the U.S., U.S. manufacturing, in turn, will be hurt painfully from the sanction. Therefore, the U.S. must choose alternative methods by requesting fines and sending "compliance officers" at the last minute to replace the sanction on ZTE. From a historical perspective, the U.S. has implemented restrictions on exporting advanced technology products (ATP) to China. However, their restrictions did not significantly hinder the rapid growth of China over the past few decades. In addition, historically, the U.S. trade wars against Japan in the 1970s and 1980s have not slowed down Japan's technological progress and industrial upgrading.

Third, technology transfer and learning could be achieved through various means, and it is almost impossible for the U.S. to stop China from learning from the world technological frontier. The channels to transfer technologies include, but are not limited to, the import of high-tech and high-quality intermediate products, the flow of staff among high-tech companies, the study and

application of patents, the return of talents from studying abroad, and the establishment of factories by foreign-funded enterprises in China. Furthermore, blocking the spread of knowledge is even more difficult in this new era with easy access to the Internet.

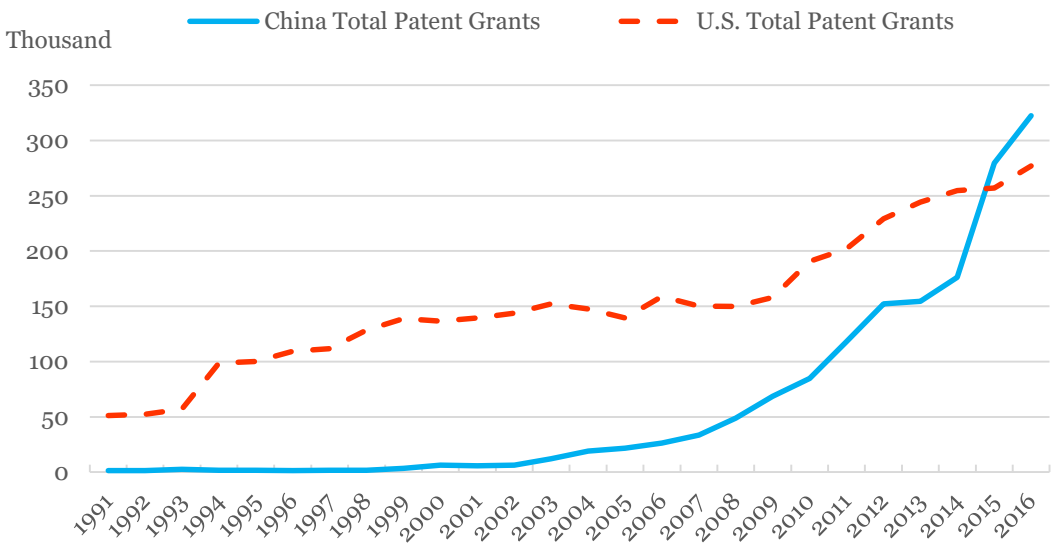
Last but not least, with the advancement of China's science and technology, independent innovation in China will be more important than technology transfer for China's long-term growth. In fact, China has been catching up with the U.S. in both innovation investments and achievements in the past 40 years. Figure 12 shows that, with a total investment of $408.8 billion in 2015, China became the second largest country in R&D expenditure in 2015, next to the U.S. but exceeding the European Union. Furthermore, the growth rate of R&D investment in China is much higher than that in the U.S. Particularly, China's R&D investment in 2015 is 11.4 times higher than its investment in 2000. During the same period of 15 years, the growth of U.S. R&D expenditure increased by approximately 85%. In addition to the absolute value of R&D investment, the ratio of R&D to GDP is another indicator of how much a country invests in scientific research. The ratio of R&D expenditure to GDP in China has dramatically increased from 0.56% in 1996 to 2.07% in 2015, while the ratio of R&D expenditure to GDP in the U.S. remained steady at roughly 2.5% during the same period. Therefore, with a surge in the investment of research and development, China is catching up with the most developed economies.



Data Source：National Science Board: Science and Engineering Indicators (2018)

Figure 12 Gross Expenditures on R&D（Billion USD）

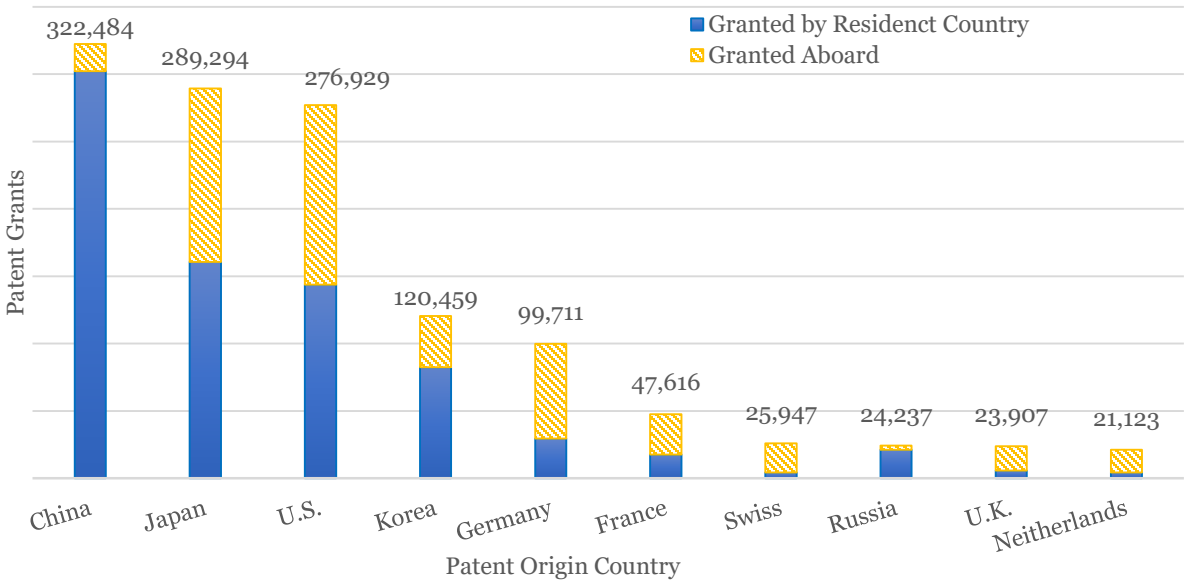
The significant increase in R&D investment has brought China fruitful achievements in recent years. The number of China-originated granted patents has exceeded the number from the U.S. since 2015 (Figure 13). Figure 14 shows that the total number of China-originated granted patents reached over 322 thousand, which exceeded the number of granted patents originating from Japan (289 thousand) and in the U.S. (277 thousand)[10]. However, we should still evaluate these figures with caution given that China's patents were mostly granted domestically, while almost half of the patents originated from Japan and the U.S. were granted overseas.



Data Source: WIPO statistics database

Figure 13 Number of Total Patent Grants in U.S. and China

[10]The data on patent grants and origination was obtained from the World Intellectual Property Organizations. https://www.wipo.int/about-ip/en/.



Data Source: WIPO statistics database

Figure 14 Top 10 Countries with the Largest Number of Granted Patents in 2016

China also has three unique advantages for further boosting its own scientific research and technological innovation. The first advantage is the easy availability of intermediate inputs, which help innovators quickly transfer their patents or innovations into prototypes and products. The second advantage is that China itself is a large domestic market, which enables firms to achieve the advantage of increasing return to scale by lowering the average cost as the sale increases, thereby helping firms become competitive in the global market. These two advantages can shorten the incubation time from turning ideas into profits.

The third advantage is human capital. According to the National Science Board in the U.S., more than 7.5 million bachelor's degrees in science and engineering were awarded worldwide in 2014, with China accounting for 22% and the U.S. accounting for only 10%. Currently, more than seven million college graduates join the labor force in China every year. The World Bank Wealth Accounting uses national household surveys in different countries to measure human capital by lifetime income of people with different levels of education. In 1995, China and the U.S. had human capital of $25 trillion and $165 trillion, respectively. The estimated human capital in the two countries rose to $86.5 trillion and $244.4 trillion in 2014, respectively. The ratio of Chinese human capital relative to the U.S. rose from 16% in 1995 to 35% in 2014. The significant increase in human capital promoted by the improved educational attainment in China has made an

important contribution to China's economic growth and technological progress. Human capital accumulation is the fundamental determinant of China's innovation and technological progress, which thereby promote high-tech manufacturing in China.

V. Concluding Remarks

This paper argues that the Trump administration is unlikely to achieve the goals of reducing the trade deficits, promoting the resurgence of U.S. manufacturing, and curbing China's high-tech manufacturing industries by levying on imports from China. On the contrary, the trade war certainly has a negative impact on the economies of the two countries and the world economy. Guo et.al. (2018) simulate cases in which the U.S. and China impose 45% tariff on all imports from the other based on a multi-country, multi-industry general equilibrium trade model and find that the bilateral trade between the two countries would collapse and that the welfare loss for two countries was substantial. The recent studies including Amiti, Redding, and Weinstein (2019) and Fajgelbaum et.al. (2019) have also affirmed that the additional tariffs levied by the U.S. have completely pass-through to U.S. consumers and firms. The trade war also created financial turbulence for two countries. The U.S. Dow Jones Industrial Average (DJI), NASDAQ Index, Shanghai Stock Index of China, and Hong Kong's Hang Seng Index all fell sharply in 2018. Thus, no one can win the trade war, and it is crucial for the governments of two countries to resolve the trade conflicts and achieve a win-win outcome through negotiations.

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