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THE "MANUFACTURING RESHORING" STRATEGY IN THE UNITED STATES AND ITS IMPLICATIONS TO CHINA

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Abstract

The manufacturing reshoring is the strategic decision of the United States, based on the assessment of the development trend about the domestic and international market. Its fundamental goal is to promote the upgrading of the manufacturing industry and maintain America's leadership during the new round of global technological revolution. In order to achieve the manufacturing reshoring goal, the U.S. government has formulated a series of policies and regulations, including technological progress policy, investment and financing policy, talent training policy, energy policy, market development policy and investment environment policy. Based on the data from the U.S. think tank, this paper systematically reviewed the latest developments in the total volume, technical composition, industrial structure, origins and whereabouts of the U.S. manufacturing reshoring, and concluded that U.S. manufacturing reshoring has a far-reaching negative impact on China's manufacturing industry. The main findings are that China's "industrial hollowing out", weakened technology spillover effect of foreign direct investment (FDI), a reduction in competitiveness of Chinese manufacturing exports, and China's heavy technology dependence on the U.S. are the results of U.S. manufacturing reshoring strategy. This paper thus proposed some countermeasures. First the Chinese government should actively lead manufacturing industry to conduct researches for technology advancement as well as industrial upgrade. Second, it should continue with the market reform, lower labor cost, improve business environment, and enhance the attractiveness of manufacturing industry. Third, with the help of "Belt and Road Initiative" strategy, it is recommended to spread the international market for China's manufacturing and lessen its technological dependence on the U.S.

Keywords: Manufacturing Reshoring, FDI, United States, Recent Policies, Implications, China

JEL Classifications: E60, F23, F68, L60

1. Introduction

The Subprime Crisis, where its outbreak began in July 2007, has turned U.S. economy into great recession (Eichengreen *et al.* 2012). The U.S. government started realizing the importance of

developing manufacturing. As a result, the Obama government came up with the strategy of manufacturing reshoring (White House, 2012). The move of American manufacturing reshoring has several underlying reasons from domestic and international perspectives. First, the contribution of manufacturing sector to the U.S. economy has significantly declined. According to World Bank (2019a), the manufacturing share, value added as a percentage of GDP, has decreased from 16.087% in 1997 to 11.154% in 2017. Although the progress of de-industrialization has significantly contributed to the rapid economic growth of America, the too much extent of de-industrialization caused weak demand of advanced manufacturing which can drive the development of high-end services (Huang *et al.* 2014; Zhou, 2016). The de-industrialization in the long run cannot support the enormous virtual economy, thereby slowing down the American economic growth and triggered the 2008 financial crisis (Huang *et al.* 2014; Zhou, 2016). Consequently, the direct purpose of the strategy of manufacturing reshoring is to implement economic restructuring and restore economy so that more capital, technologies, and labor will be transferred to the manufacturing sector, which, in turn, will make American economy back to normal from the financial crisis.

Furthermore, the macro environment, including U.S. unemployment rate and the inequality of income as well as the social stability, is suboptimal. The employment in manufacturing has decreased over time, where out of all labor force, 32% was employed in the manufacturing businesses in 1953, but that percentage declined to only 8.7% in 2015 (Chien and Morris, 2017). Meanwhile, the income gap has become wider. Based on Nadia (2016), from 1989 to 2013, the top 10% wealthiest households in the United States rose from 67% to 76%, while the wealth of the poorest 50% households fell from 3% to 1%, and from 1979 to 2007, the income of top 1% wealthiest population in the U.S. has increased 2.75 times, while the income of 20% poorest population only goes up by 18%. DeNavas-Walt *et al.* (2011) has pointed out that the total number of populations living in poverty increased to 46.2 million, a new historical record since 1950s. The important reasons for the deterioration of inequality in income are massive enterprise outsourcing, manufacturing hollowing out, more unemployment, and reduction in the number of middle class. Given this background, the Obama government carried out the policy of manufacturing reshoring to change the trend of widening income gap between the rich and poor, improving the employment and social stability (Hu and Wang, 2014).

Third, the new round of global industry competition helps with the manufacturing reshoring in America. The new round industrial revolution, especially Industry 4.0 as a representation, has taken place, and there are more and more new industries and formats, which elicits the radical revolution of commodity production model and production organization form. The current global value chain will encounter decomposition, convergence, and innovation, pushing the restructure of global value chain, thereby causing the value addition in each step of value chain to fluctuate. One of the biggest changes is the process of manufacturing. Goods manufacturing will be transformed from pipelined simple processing assembly in the past to intellectualized manufacturing processing involved with knowledge-intensive and technology-intensive features. Production process will constitute a higher weight, in order to gain higher value-added in each value chain division. The manufacturing reshoring is based on the pursuit of a greater value addition in each value chain step, achieving a commanding position in the formation of a new global value chain and firmly controlling the leading position in the new global division of labor.

The U.S. manufacturing reshoring strategy has caused extensive discussions in the theoretical community. The main points of existing literature can be summarized into two categories. One category believes that manufacturing reshoring is unlikely to succeed, and its impact on Chinese manufacturing may be ignored. Chandy and Seidel (2016) wrote that with the election of Trump, the power of anti-globalization has begun to heat up in the United States to some extent. However, globalization is still a long-term trend. Therefore, they are pessimistic about U.S. manufacturing reshoring. Zhou (2016) pointed out that the manufacturing reshoring is a political reflection of the economic and social consequences stemming from globalization led by capitalism since the 1980s, but it cannot change the trend of globalization (Wang and Miao, 2017). Sheng and Zong (2017) believed that the current anti-globalization phenomenon in the United States is resulted from many factors such as, the increase in the United States' domestic

income gap, the industrial hollowing out, the threat of immigration and terrorism, and the rise of anti-institutional forces. In the long run, globalization is the natural result of human society's pursuit of development, and the anti-globalization will be frustrated and will once again turn to the track of globalization. The above views are all optimistic about globalization. According to this logic, the U.S. manufacturing reshoring as a counter-globalization concept will certainly fail.

The other view contends that the U.S. manufacturing reshoring has a significant impact on Chinese manufacturing. Xu (2013) selected five variables which are U.S. inventions authorized in Chinese manufacturing, exports of Chinese manufacturing to the United States, U.S. foreign direct investment in China, the exchange rate of the Chinese Yuan against the U.S. Dollar, and the wage ratio between Chinese and U.S. manufacturing workers. Based on the 15-year time series data from 1997 to 2011, with the "Revealed Comparative Advantage" (RCA) index measuring the competitiveness of China's manufacturing exports introduced, and empirical analysis was conducted through the principal component analysis method. Xu (2013) found that the number of U.S. patents in China, the number of Chinese exports to the United States, and other core indicators shows a positive correlation with export competitiveness of the Chinese manufacturing. Xu (2014) selected the panel data of ten sub-industries from China's electronics and communications equipment manufacturing as well as computer and office equipment manufacturing industries during 2004-2012 to conduct empirical study. The results of the study showed that the increase in foreign investment will promote the industrial upgrading in the industry and will drive the adjustment of China's manufacturing structure to high-end areas. Conversely, the reduction in foreign investment will hinder China's industrial upgrading.

The above literature studies the impact of the American manufacturing reshoring on China's manufacturing industry from the perspective of overall judgment or empirical researches, but few documents have conducted in-depth research on the reality of the progress of U.S. manufacturing reshoring. This article attempts to go over a series of U.S. manufacturing reshoring policies. It then uses statistical data to analyze the latest developments in the total volume, technical composition, industrial structure, origins and whereabouts of U.S. manufacturing reshoring, further exploring the economic effects of U.S. manufacturing reshoring. In the last part, it discusses U.S. manufacturing reshoring's potential implications to China.

2. Major U.S. Manufacturing Reshoring Policies

In order to encourage the manufacturing reshoring, the United States has promulgated a series of policies, including the legal framework, project plans, and the establishment of related institutions. The United States Senate passed the "American Recovery and Reinvestment Act" in 2009 (Xu, 2013). In the same year, the House of Representatives passed the "American Clean Energy and Security Act of 2009" (Xu, 2013). In 2010, President Obama formally signed and enacted the "United States Manufacturing Enhancement Act of 2010" (Xu, 2013). After Trump took office in January 2017, the pace of policy making on manufacturing reshoring has accelerated (Thuermer, 2017; Moser and Kelley, 2018). In addition to tax reduction plans and tariff increase (Moser and Kelley, 2018), President Trump has also decided to establish the Office of Trade and Manufacturing Policy within the White House, and promote manufacturing reshoring through various policies (White House, 2017). It is worth mentioning that Trump's tax reform plan was passed by the Senate in December 2017, leading to a big step forward regarding the U.S. tax relief program (Ding and Chen, 2017).

Based on the summary of U.S. manufacturing reshoring policies, it is obvious that policy portfolio of U.S. manufacturing reshoring is consistent with the basic economic principles of corporate profit maximization. According to Wei (2007), the new Cobb-Douglas production function $Y = AF(K, L, E)$, where A is technology, K is capital, L is labor, and E is energy. As shown in Figure 1, the U.S. manufacturing reshoring policy can be divided into six categories: technological progress policy, investment and financing policy, talent training policy, energy policy, market development policy, and investment environment policy. Its goal is to encourage the U.S. to improve the investment environment and reduce manufacturing costs, attracting the reshoring of U.S. manufacturing, and promoting U.S. economic development and prosperity.

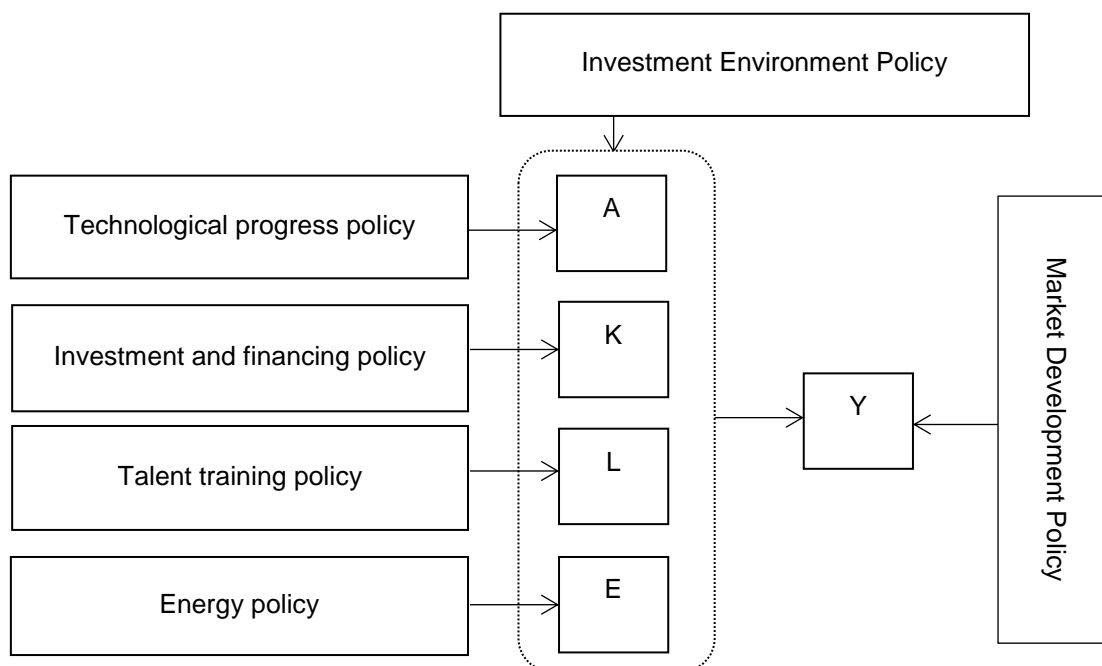


Figure 1. Analysis of Policy Framework for U.S. Manufacturing Reshoring

2.1. Technological Progress Policy

In terms of technological progress policies, the main approach of the United States is to further strengthen the supporting policy for technological innovation and increase investments in high-tech research and development. Among them, the most direct and important policy is that Obama jointly promotes the establishment of the National Network for Manufacturing Innovation (NNMI) with the government, academia, and the business community, and publishes the “A National Strategic Plan for Advanced Manufacturing” (Cai and Liu, 2015). The Federal Government then invested \$1 billion in the establishment of 15 manufacturing innovation institutes, with the aim of further accelerating the industrial transformation of basic research results (Cai and Liu, 2015). At present, the United States has established the National Additive Manufacturing Innovation Institute, the Next Generation Power Electronics National Manufacturing Innovation Institute, the Digital Manufacturing and Design Innovation Institute, American Lightweight Materials Manufacturing Innovation Institute, the American Institute for Manufacturing Integrated Photonics, the Composites Innovation Centre and many other manufacturing innovative institutes (Zhu and Luo, 2013). A series of supportive policies for technological innovation have enabled the United States to further enhance its technological innovation capabilities, where innovation capabilities and innovation dynamism have become important factors in attracting high-end U.S. manufacturing. At the same time, the innovation and industrial application of advanced manufacturing technologies such as additive manufacturing and industrial robots can greatly increase the production efficiency of manufacturing companies. With the declining prices in advanced technology and equipment and its increasing substitution effect on the labor force, the economy of manufacturing reshoring to the United States will become more prominent. For example, similar to the establishment of an unmanned factory, it not only can achieve high efficiency, high reliability and uninterrupted operation, but also can effectively reduce manufacturing costs.

2.2. Investment and Financing Policy

In terms of investment and financing, the United States has introduced a monetary policy that focuses on quantitative easing (QE). Since 2008, the United States has implemented a total of three rounds of QE to stimulate economic recovery (Lee, 2014). Under quantitative easing

measures, the release of a large amount of liquidity prompted the weakening of the U.S. Dollar exchange rate, which not only provided a relatively relaxed financing environment for U.S. industry development, but also directly improved the international competitiveness of U.S. products. Since the 2008 financial crisis, the U.S. currency and quasi-monetary growth have been relatively fast, and domestic credit growth has been large. The proportion of credit outstanding to GDP has continued to rise since 2010 (Federal Reserve Bank of St. Louis, 2019). Loose capital supply has undoubtedly provided a good financing environment for the manufacturing reshoring. Although since 2013, the U.S. real interest rate is higher than Japan, it still has outstanding comparative advantages compared with China and India (World Bank, 2019b). In addition, the United States not only provides financial support for small and medium-sized enterprises (SMEs) through direct investment, but also facilitates trade financing for SMEs (International Trade Administration, 2012).

2.3. Talent Training Policy

Regarding talent training, the United States further intensified the system of fostering innovative talents and improving vocational education. Thinking of innovation as the source of competitiveness, the U.S. considers fostering people's innovation ability to promote technology advancement and business development as a key weapon to revitalize "Made in the United States." On the one hand, the United States further improves the education system, strengthens the contacts and interaction between education and industry, strengthens basic education, promotes the resource sharing and innovation interactions among elite schools, and deploys the knowledge and skills required for the future development of the industry in school education, shortening the training time from students to employees to meet the talent needs of enterprises and reduce the cost of employment (Wei and Liu, 2016). On the other hand, the United States has also weakened the rights of unions, restricted union activities, strengthened vocational education and worker training, and improved worker skills and entrepreneurial management (Wei and Liu, 2016).

2.4. Energy Policy

Concerning energy, the United States continues to promote the so-called "energy independence." In fact, the "cheap energy" enjoyed by current U.S. industrial development is mainly due to the "energy independence" policy that the U.S. has been continuing to implement in recent years and the great achievements it has made in oil and gas development, new energy development, energy conservation, and energy efficiency improvement. The U.S. has developed and enacted a series of laws and plans in the energy sector such as the "the Energy Independence and Security Act of 2007," "American Clean Energy and Security Act of 2009," "Blueprint for a Secure Energy Future," "2011 Strategic Plan," and "the All-Of-The-Above Energy Strategy as a Path to Sustainable Economic Growth" (Yang, 2015). These policies have played an important role in promoting the expansion and structural adjustment of the total energy production in the United States. In recent years, the rapid development of renewable energy such as shale gas, nuclear power, photovoltaic, and wind power in the United States is the reflection of these policies. In particular, recently the U.S. "shale gas revolution" has achieved outstanding results. The rapid growth of shale gas production has not only ensured the energy demand for U.S. industry development, but also drove the U.S. natural gas prices to drop sharply and has driven down other energy prices such as petroleum through substitution effects (Gao, 2017).

2.5. Market Development Policy

In respect of market expansion, the United States introduced a range of policies such as, preferential export and the purchase of domestic goods. In terms of exports, the United States established an inter-departmental "export promotion cabinet" in 2010, followed by the implementation of the "National Export Initiative (NEI)" and the establishment of a \$ 2 billion export-import bank credit tool to help SMEs expand into overseas markets, which is also known

as the “export multiplier program” (Ilias *et al.* 2013). In 2014, the United States launched the second-generation “National Export Initiative” to further strengthen the effects of export revitalization achieved previously. In the field of expansion in demand of the domestic market, in 2009, the United States formally launched the “purchase domestic product” policy in its economic stimulus program, which clearly stipulates that the steel used in the US infrastructure construction projects must be produced domestically, directly increasing the weight of American products by 6% when purchasing products (Ilias *et al.* 2013). Since 2017, the U.S. Department of Defense has even demanded that the military must implement the policy of purchasing “Made in the USA” athletic footwear (Platzer, 2016). In addition, the United States also supports the global market expansion of SMEs with preferential government procurement (Office of the United States Trade Representative, n.d.).

2.6. Investment Environment Policy

To improve investment environment, the United States not only vigorously perfected the infrastructure, but also focused on creating a positive social atmosphere for the manufacturing reshoring. On the one hand, the United States supports infrastructure construction through tax cuts and direct government investment. For example, The American Recovery and Reinvestment Act of 2009 by Obama government includes massive tax cuts and billions of Dollars investment in significant sectors including infrastructure (U.S. Department of Education, 2009). On the other hand, the United States has continued to strengthen its patriotic public opinion and called for multinational companies to return to America. For example, the United States launched the “Manufacturing Day” in October 2012 (Nash-Hoff, 2012). More directly, the U.S. government gives direct tax relief and subsidy measures to manufacturers who have reshored to America. For example, the “Creating American Jobs and Ending Offshoring Act” introduced in the congress in September, 2010 would provide a two-year payroll tax relief for companies that are reshoring jobs from overseas, and would terminate tax incentives and subsidies to companies that are moving their factories offshore (Sanders, 2010).

3. The Latest Progress of U.S. Manufacturing Reshoring

3.1. Increases in the Number of U.S. Manufacturing Reshoring and Employment

Regarding the number of companies’ reshoring to the United States, there were only 16 in 2010, 64 in 2011, 210 in 2013, and nearly 300 in 2014 (Ma, 2017). According to Reshoring Initiative (2019), the cumulative number of U.S. company reshoring from 2010 to 2016 reached 954 (times). Based on Figure 2 where the FDI data is calculated from UNCTAD (2019), FDI in the United States has been in a state of net outflow since the financial crisis in 2008, but it has been reversed since 2015 (Sun, 2018). FDI net inflows have shown a rapid upward trend in 2018. In summary, the U.S. manufacturing industry is showing a clear reshoring trend although it has big fluctuations recently.

The U.S. manufacturing reshoring has produced a greater pull effect on U.S. employment. Since Obama’s promise to bring back manufacturing from overseas in 2009 (Hamburger *et al.* 2012), the situation of job losses began to slowly improve. Until 2014-2015, the jobs losses caused by the offshore production of manufacturing and the job creation by the manufacturing reshoring have achieved balance (Reshoring Initiative, 2019). In 2016, the number of jobs reshored outpaced the number of job losses to offshoring, resulting in a net increase of about 30,000 jobs, and achieved the net increase in the number of jobs for the first time since the 1970s (Reshoring Initiative, 2019). Statistics show that due to reshoring and FDI, 60,000 jobs were created in 2014, and 67,000 in 2015; in 2016, this amount has exceeded 77,000 (Reshoring Initiative, 2019). From the perspective of growth rate, the average annual growth rate of new jobs created in 2010-2016 reached 51%. It is noteworthy that the number of jobs brought by FDI before 2015 is greater than the number of jobs brought about by the manufacturing reshoring. From 2015 to 2016, the manufacturing reshoring rate has accelerated, and the number of jobs created by the manufacturing reshoring has exceeded the number of jobs brought by FDI (Fratocchi *et al.* 2016).

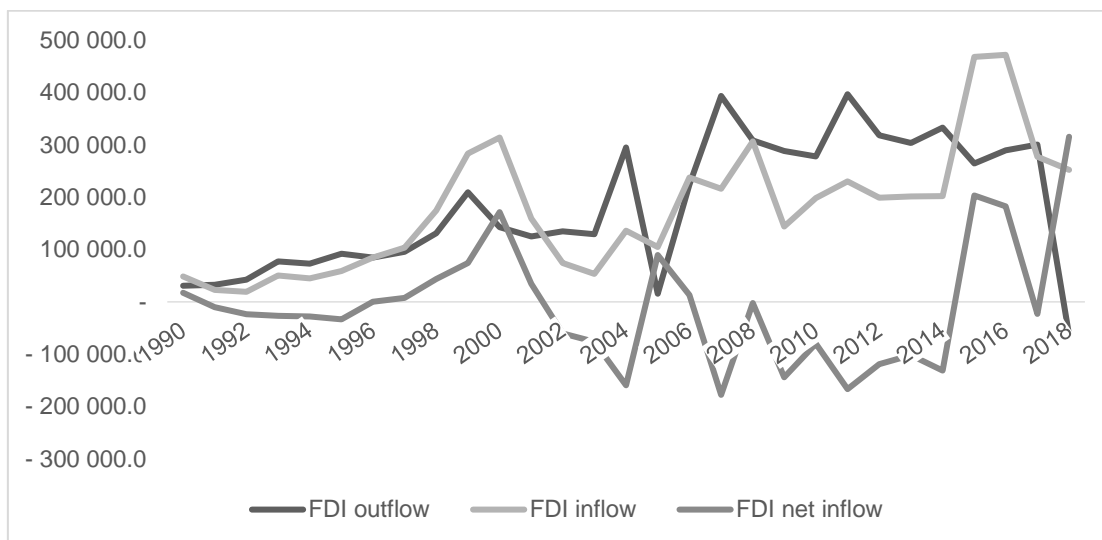


Figure 2. Net Inflow of FDI in the United States (1990-2018, in millions of Dollars)

Source: Author's compilation based on data from UNCTAD (2019)

3.2. Technical Composition of U.S. Manufacturing Reshoring

According to the National Science Foundation (NSF) and OECD industry classification standards, based on product technology classification, the U.S. manufacturing reshoring and FDI are divided into high-end, medium-high-end, medium-low-end and low-end four grades. From the corporate data on the manufacturing reshoring from 2010 to 2018 (Table 1), the biggest proportion out of all companies are low-end companies, reaching 48%, followed by medium-high-end and medium-low-end companies, accounting for 39%. Least percentage is high-end manufacturing, accounting for only 14%. According to FDI data, the highest proportion is medium-high-end manufacturing, with the proportion reaching 43%, followed by the medium-low-end, and finally the high-end and low-end. Looking back at the manufacturing reshoring and FDI together, the number of low and medium-high-end companies is the highest. As for employment, the ratio of works brought by medium-high-end companies reshoring and FDI is the highest. If the industry is simplified to only include high-end and low-end categories, the highest share among all United States manufacturing reshoring would be low-end enterprises, accounting for 48%, which will change our general expectations for the reshoring of the United States manufacturing. On the whole, the reshoring of the US manufacturing industry or the introduction of FDI focuses more on the balanced development of all technology-level industries, which can better reduce the trade deficit and solve a wider range of employment problems. Therefore, in recent years, the output level of the low-tech industry in the United States has begun to rise, such as clothing, wood, plastics and rubber industries.

Table 1. U.S. Manufacturing Reshoring and FDI Technology Level Distribution (2010-2018)

Product technology level	Manufacturing Reshoring		FDI		Manufacturing Reshoring + FDI	
	Job Posts	Firms	Job Posts	Firms	Job Posts	Firms
High	32%	14%	16%	19%	21%	16%
Medium High	35%	19%	50%	43%	45%	31%
Medium Low	12%	20%	20%	24%	17%	22%
Low	21%	48%	15%	14%	17%	31%
H+MH	67%	33%	66%	62%	66%	48%
ML+L	33%	67%	34%	38%	34%	52%

Source: Reshoring Initiative (2019)

3.3. Industrial Structure of U.S. Manufacturing Reshoring

In terms of the U.S. manufacturing industry structure, between 2010 and 2018 (Table 2), the top 10 industries reshoring back to the U.S. and the U.S. FDI industry are transportation equipment, computer & electronic products, electrical equipment, appliances & components, chemicals, plastic & rubber products, apparel & textiles, wood & paper products, machinery, fabricated metal products, medical equipment & supplies (Reshoring Initiative, 2019). Among the top 10, transportation equipment, electrical equipment, appliances & components, and computer/electronic products are technology-intensive industries according to factor intensity; fabricated metal products, medical equipment & supplies, chemicals, and machinery industries are capital-intensive industries; plastics/rubber products, apparel /textiles, wood and paper products are labor-intensive industries. This shows that the U.S. manufacturing reshoring does not just comprise high-tech industry. The result is consistent with the technical composition from the previous section.

Table 2. U.S. Manufacturing Reshoring + FDI by industry (2010-2018)

Ranking	Industry	NAICS code	Job Posts	Firms
1	Transportation Equipment	336	243,766	772
2	Computer & Electronic Products	334	87,484	416
3	Electrical Equipment, Appliances & Components	335	76,409	375
4	Chemicals	325	75,799	409
5	Plastic & Rubber Products	326	41,452	351
6	Apparel & Textiles	313,314,315, 316	38,623	560
7	Wood & Paper Products	321, 322	38,330	116
8	machinery	333	27,842	269
9	Fabricated Metal Products	332	25,427	365
10	Medical Equipment & Supplies	33911	22,374	124

Source: Reshoring Initiative (2019)

3.4. The Origin and Whereabouts of U.S. Manufacturing Reshoring

According to a research report by the Reshoring Initiative (2019), in recent years, in terms of the number of companies or the number of jobs, the origin of the majority US manufacturing reshoring is China. Based on the data of the US manufacturing reshoring from 2010 to 2018 (Table 3), China accounts for 59% of the total return (Reshoring Initiative, 2019). From the data point of view, China ranks the first in the top 20 countries, and most of the rest U.S. manufacturing reshoring comes from developed countries and emerging market countries.

Table 3. The Origin of U.S. Manufacturing Reshoring + FDI (2010-2018)

Rank	Country	Job Posts	Firm	Rank	Country	Job Posts	Firm
1	China	64,252	791	11	Jordan	405	3
2	Mexico	19,651	108	12	Sri Lanka	373	5
3	Japan	6,615	35	13	India	267	19
4	Canada	5,900	62	14	UAE	219	3
5	Singapore	4,320	5	15	Brazil	189	3
6	Switzerland	1,472	5	16	Hungary	189	3
7	Spain	1,215	5	17	Sweden	162	5
8	UK	975	11	18	Germany	122	11
9	Russia	813	5	19	Korea	122	16
10	Italy	559	24	20	Belgium	105	8

Source: Reshoring Initiative (2019)

The U.S. manufacturing reshoring takes cost and production efficiency into account (Vanchan *et al.* 2018). According to the accumulated data of the U.S. 2010-2018 Reshoring and FDI Cases by State (Table 4), the United States has the largest number of jobs in the South and Midwestern regions, followed by the Northeast and West (Reshoring Initiative, 2019). South Carolina, Tennessee, Michigan, Georgia and Alabama are in the front row. This spatial layout is mainly due to the fact that the manufacturing bases in the southeastern and mid-western United States are strong with lower costs and greater competitiveness.

Table 4. By State, Reshoring + FDI, 2010-2018

Rank	State	Job Posts	Firm	Rank	State	Job Posts	Firm
1	South Carolina	81,527	345	6	North Carolina	40,192	298
2	Tennessee	52,696	225	7	Texas	39,788	239
3	Michigan	45,929	248	8	New York	31,544	299
4	Georgia	42,894	212	9	Ohio	30,884	233
5	Alabama	42,749	174	10	Kentucky	25,024	146

Source: Reshoring Initiative (2019)

In addition to the reshoring back to the United States, some manufacturing firms have reshored to areas that are closer to the United States such as Canada and Mexico. This is called nearshoring. Near-shore production has many advantages. On the one hand, it can play a certain role in the domestic economy of the United States. For example, in Mexico, production is exported to the United States, and the product has 40% of the United States made (Reshoring Initiative, 2019). In China, the proportion is only 5% (Reshoring Initiative, 2019). Based on this, the production of transportation equipment and electrical appliances mostly uses the near-shore production model. Data from Reshoring Initiative's report between 2010 and 2018 shows that more manufacturing companies are moving to Mexico than Canada, mainly due to lower production costs in Mexico (Reshoring Initiative, 2019).

4. Implications of U.S Manufacturing Reshoring to China

At present, the global manufacturing revolution characterized by informatization, intellectualization, internetization, and big data is happening. In addition to the United States, Germany, the United Kingdom, Japan, and other manufacturing powers are all aware that informatization cannot develop without advanced manufacturing. Thus, each country has released related strategies: the Germany's "INDUSTRIE 4.0 initiative", UK's Industrial Strategy, and Japan's "Smart Manufacturing". A common feature of these strategies is the combination of hardware and software, continuous breakthroughs in high-precision technology, smart manufacturing, and cutting-edge manufacturing markets with the goal to complete the layout of the future manufacturing industry. This will inevitably lead to the restructuring of global value chains and the reshuffling of the global industrial competition landscape. Therefore, the U.S. manufacturing reshoring must not be simply analyzed from the surface. Instead, it is a long-term strategic arrangement that conforms to the global scientific and technological changes and the needs of domestic economic development. Based on this, it is predicted that the U.S. manufacturing reshoring has policy continuity and that it has far-reaching negative implications for China's current and future conditions.

First, a siphon effect may be formed, leading to China's "industrial hollowing out" tendency. With the help of the manufacturing reshoring policy, the cost advantage in the United States has gradually emerged. The Boston Consulting Group's "Global Manufacturing Cost-Competitiveness Index" compiled in 2014 shows that the combined costs of manufacturing in China and the United States are already almost the same, and it is predicted that the cost of manufacturing in the United States in a few years will be cheaper than that in China (Sirkin *et al.* 2014). Among them, the costs of land, logistics, energy, capital, taxation, and customs clearance are all lower than those in China. In China, only labor costs are still dominantly lower, but the United States has a higher level of automation and uses less labor. Moreover, the U.S. business environment is superior to China. According to World Bank (2016), the United States ranks 8th in

the world, whereas China only ranks 78th, which shows that the gap between the two countries is large. In addition, the U.S. government has adopted trade protectionism on global manufacturing bases including China and has given policy incentives to companies that have returned back to or invested in the U.S. This kind of combined U.S. tactics have accelerated the flow of U.S.-funded and non-U.S.-owned manufacturing firms to the United States to some extent. Under the superposition of many factors mentioned above, it is possible to form a siphon effect, leading to the phenomenon of "industrial hollowing out" in China.

Second, the technology spillover effect of foreign-funded enterprises in China is weakened, which restricts the transformation and upgrading of China's manufacturing. The technology spillover effect of foreign direct investment (FDI) on Chinese manufacturing through the trade in intermediate products has reached a consensus in the academic community (Shao and Liu, 2011; Jiang and Feng, 2012; Wang, 2015; Shen and Zhang, 2016). The return of U.S.-owned and other foreign-funded manufacturing enterprises to the United States will change the supply chain trade of China's manufacturing industry and will drive the shift of foreign-invested R&D centers, resulting in a weakening spillover effects of foreign technology. At the same time, the United States has already regarded China as a potential competitor in the process of manufacturing reshoring and will intensify its efforts to limit China's capital output and block high-end technologies. This will produce a greater negative impact on Chinese advanced manufacturing industry when further upgrading the global value chain.

Third, the U.S. manufacturing reshoring has caused China's manufacturing exports to be blocked. From the perspective of U.S. policy, the manufacturing reshoring is closely linked to trade protection. Since Trump took office, trade protectionism has begun to rise (Irwin, 2017). The formal launch of the "section 301 investigation" to China on August 18, 2017 is an example (Yu, 2018). In the future, the possibility of trade friction between China and the United States will greatly increase on issues such as import tariffs, intellectual property protection, and the exchange rate. Moreover, the United States has created a substitution or crowding-out effect on China's exports. For the domestic market in the United States, the U.S. manufacturing reshoring has increased the output of U.S. domestic products, and some products may become exports instead of imports, reducing market demand. Affected by the "America First" policy, the United States has been encouraging the consumption of the domestic goods, coupled with the continuous decline in the cost of manufacturing in the United States, the competitiveness of China's export products has been relatively declining.

Fourth, the U.S. manufacturing reshoring would lead to China's technological attachment to the United States. Given the technological advantages of the United States, the manufacturing that has returned will inevitably integrate closely with new-generation technologies such as informatization, intellectualization, and internetization to create high value-added industries. This model will help the United States master the monopoly advantage in its core technology and form the "U.S. Leading, China Dependent" model. At present, Chinese manufacturing still lacks core technologies and key components in many areas. Once the United States takes up the commanding heights of the global value chain and forms a monopoly, its ability to control the global value chain longitudinally will become stronger. This damage will be even greater to related sectors in China. On the one hand, the United States will therefore obtain the standard setting and pricing power of products; on the other hand, China's manufacturing has to rely on U.S. technical support in order to develop further. If Chinese manufacturing cannot achieve breakthroughs in core technologies in a limited period of time to break this passive situation, it will be difficult for China to get rid of technical dependence on the United States.

In the face of the impact of the U.S. manufacturing reshoring, China must plan ahead and make early arrangements to minimize its negative impact. It is suggested that the government take the lead, work with companies, industry associations, and research institutes to achieve reasonable planning and guidance, encourage companies to enter the global value chain from the high end of the value chain, and determine to focus on strategic emerging industries and independently develop core technologies to achieve technological advancement and industrial upgrading. Under the background of Industry 4.0, China's manufacturing can grasp the "window of opportunity" to catch up with technology and realize transcendental development. In addition, the Chinese government is recommended to further intensify the reform, free up the reform

dividend, strive to reduce the overall cost of the enterprise, enhance the business environment, and increase the attractiveness of the advanced manufacturing industry. Finally, in conjunction with the "Belt and Road Initiative" strategy, the government needs to continue pioneering overseas markets besides the United States, and lead some advanced manufacturing industries to move toward a broader international market and reduce excessive dependence on the U.S. market.

5. Conclusion

This paper at the beginning discusses the background and motives of U.S. manufacturing reshoring strategy. First, the 2008 financial crisis forced the U.S. government to reassess the need for manufacturing reshoring to recover the economy. There are challenges from domestic and international perspective. The manufacturing sector contributed less to the U.S. economy in the past, while de-industrialization would also drag the economic growth. Second, the unemployment rate, income inequality, and social stability all have worsened in America. One of manufacturing reshoring's purposes is to stop these trends and improve the economy. Third, the fierce global industry competition is helpful to spur manufacturing reshoring in America.

There has been a large number of researches to assess whether the U.S. manufacturing reshoring has a significant impact on Chinese manufacturing. However, few evidences have conducted in-depth analysis on the progress of U.S. manufacturing reshoring. Hence, this study goes over a series of U.S. manufacturing reshoring policies such as, technological progress policy and investment environment policy. It then uses the recent data from various sources including UNCTAD and Reshoring Initiative to analyze the current trend and effect of U.S. manufacturing reshoring strategy from several aspects such as, technical composition and industrial structure of U.S. manufacturing reshoring. One of major findings is that the manufacturing reshoring strategy has been playing a positive role in attracting more U.S. manufacturing back to America, and more jobs are brought back to the U.S. as well.

The U.S. manufacturing reshoring has seminal implications to China in addition to the U.S. itself, given the global manufacturing revolution background in many countries such as, Germany and Japan. The first implication is that the cost advantage in the U.S. has increased significantly, catching up with China fast. The U.S. business environment also is far superior to China. The U.S. government's trade protectionism provides significant incentives for manufacturing reshoring. All these factors together form a siphon effect, which causes China's "industrial hollowing out" trend. That is, a large number of foreign manufacturing, not limited to U.S. owned companies, has flowed back to U.S. from China. Furthermore, the technology spillover effect of foreign-invested enterprises is reduced because of two reasons. First, the recent significant withdrawal of foreign manufacturing companies alters the supply chain trade of Chinese manufacturing and removes more R&D centers. Second, the U.S. has regarded China as a potential threat in the manufacturing sector, so that it blocks China's capital output and high-end technologies. Moreover, the U.S. government enacts a series of trade policies like "America First" policy to promote consumption of domestic goods, with the decline in manufacturing cost in America, the Chinese manufacturing exports are becoming uncompetitive. In addition, the U.S. manufacturing reshoring has brought back the most advanced manufacturing companies from China, making China even harder to develop its own core technology. This intensifies China's manufacturing dependence on U.S. technical support.

In response to these challenges resulting from U.S. manufacturing reshoring, this paper proposed the following: the Chinese government should proactively assume its responsibility to encourage more firms to conduct R&D to achieve technology progress and industrial upgrade; it should also further its market reform, lower manufacturing cost, better business environment, and improve the competitiveness of manufacturing; with the recent "Belt and Road Initiative" strategy, it should partner with other countries to broaden the international market and minimize the heavy technology dependence of Chinese manufacturing on America.

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