

# The Era of Flexible Supply Chain is Coming-

## The Impact on Taiwan Fastener Industry



Article by: **Dr. Wayne Sung** / Copyright owned by Fastener World

"Since the 1980s, when the former U.S. President Reagan and former British Prime Minister Margaret Thatcher advocated the free flow of capital, manpower, trade, and goods from the developed countries to the low-cost developing countries, the supply chain of industries was expanded from the developing countries to the whole world, thus the "global supply chain" took shape and the four countries led by China, India, Brazil, and Russia became the focus of global investment, that is, the BRICs, which started the operation mechanism of high-efficiency production and low-cost cooperation. Under the operation of the "global supply chain", the world has maintained low prices for 30 years and China has become the world's factory, with a large number of products sold from China to the world. China's GDP reached US\$6 trillion in 2010, surpassing Japan to become the second largest economy after the United States, and the "global supply chain" ushered in the golden age of China's rapid economic growth.

The "anti-globalization" started in 2016, when the United Kingdom decided to leave the European Union in a referendum, and in 2018, when President Trump of the Republican Party of the United States launched a trade war, imposing high tariffs on U.S. products imported from China, and China also launched a high tariff countermeasure. The high import tariffs between

China and the U.S. have not been eliminated after the Liberal Party's President Biden takes office in 2021, but are still entangled and even getting worse. At the end of 2020, a new virus broke out in Wuhan, China, and the city was sealed off. The export of Chinese products was blocked overnight and the global supply chain was disrupted. Subsequently, due to the container regulation problem, the port of congestion and container shortage caused a disruption in the chain, accompanied by high freight rates on the globalization supply chain and again caused an impact. 2022 has become the last straw to break the camels' back of globalization. On the one hand, Russia invaded Ukraine, Europe became a war zone, energy and food caused panic, and the world is facing the fear of a third world war again. On the other hand, the U.S. and China have escalated from a trade war to a technology war, with Chinese products such as Huawei, ZTE and Hikvision being banned by the U.S., and then from a technology war to a chip war, with the U.S. completely blocking chip manufacturers from selling their products to China in October 2022. The U.S. announced that all wafer manufacturers worldwide must obtain permission from the U.S. government to export their wafers to China, as long as they use U.S. production equipment or application software and patents. The U.S. also pushed TSMC, the world's largest wafer fabricator, to set up a production plant in the U.S. The "anti-globalization" is officially on the world stage.



On March 16, 2023, during the groundbreaking ceremony for TSMC's Arizona fab, founder Morris Chang said, "Globalization is almost dead, and free trade is almost dead." In the mind of Chang, the "high efficiency" and "low cost" mindset of the global supply chain has been transformed into "national security", "risk control" and "prevention of chain breakage" under the high uncertainty of the threat of chain breakage and war. The author observes that since the supply chain disruption caused by Covid-19, the food and energy crisis caused by the war between Russia and Ukraine, and the increasingly tense economic conflict between China and the U.S., globalization has gradually become a bipolar development trend, with the U.S. and China at each end of the spectrum, the most obvious of which is the U.S.-China chip war. TSMC is forced to choose a side to the United States and will produce the most advanced three-nanometer process chips in Arizona. Because of the huge difference between the labor force in the U.S. and Taiwan, the cost of wafer production in the U.S. will be several times higher than that of Taiwan products. Imagine if TSMC's U.S. fab is mainly for core national industries such as aerospace, defense, and military. Under the dual conditions of national security and high profitability of the industry itself, a few times higher wafer manufacturing costs will not be a consideration at all.

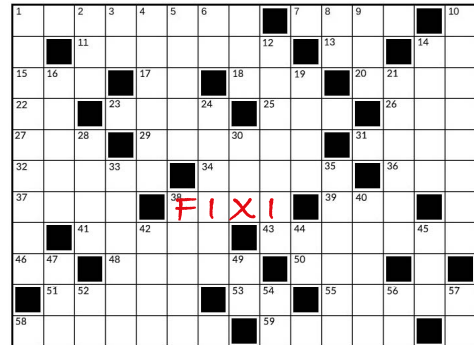
In fact, since the U.S. launched a trade war against China, globalization has become a bipolar trend, just like the confrontation between the U.S. and the Soviet Union during the Cold War, and in the future, the U.S.-led free trade bloc will gradually form against the China-led national economic bloc in the international trade arena. After the outbreak of the Russian-Ukrainian war, the supply chains of raw materials, energy, food, etc. have been "cut off" and **international procurement is no longer based only on economic factors, but "national security" and "supply chain risk management" are two other important factors that must be considered.** Therefore, the globalized supply chain is bound to be adjusted, and any country must create a new supply chain under "national security" and "supply chain risk management". On March 6, 2023, **Tesla, the leading electric vehicle manufacturer, announced that it will build a new factory in Nuevo Leon, Mexico, which will be the world's largest electric vehicle factory,** covering nearly 4,200 acres, 20 times the size of its Shanghai factory in China, with an estimated production capacity of 20 million vehicles by 2030. Whether it is TSMC's U.S. plant or Tesla's plant in Mexico, both events have a common denominator, which is to bring the production base closer to the U.S. or U.S. neighboring countries. Therefore, in the future, the international supply chain will definitely be readjusted, and each country will form its own alliance and move closer to the two poles of China and the United States, and the world's supply chain ecosystem will be reshuffled.

In the author's opinion, **the future "global supply chain" based on economic considerations will not disappear, but rather cooperate with the "regional supply chain" formed by neighboring countries, which is the model of "flexible globalization" and the new thinking of "flexible supply chain".** Graph 1 below divides the economic and political considerations into four quadrants. The first quadrant is for industries with high political and economic considerations, such as the chip industry; the second quadrant is for industries with low political and high economic considerations, such as the necessities of life and metal fasteners; the third quadrant is for industries with low political and economic considerations, such as the domestic demand service industry; and the fourth quadrant is for industries with

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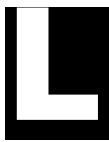
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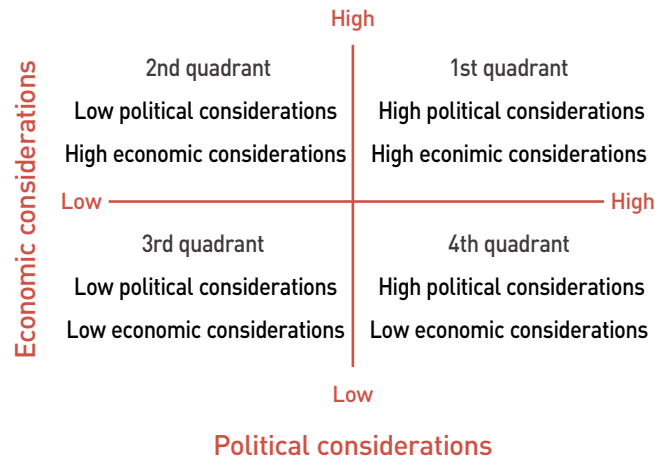
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high political and low economic considerations, such as the aerospace and military industries.

## Graph 1. Economic and Political Considerations of Industry Differentiation



The first quadrant will be based on both economic and political considerations. For example, for wafer production, the country must have sufficient production capacity so that once foreign production stops, the domestic factories can be self-sufficient, and cost is no longer the main factor. The defense industry in the fourth quadrant of the same nature will not consider the cost factor at all, but rather national security, and will definitely keep the industry in the country. In terms of the wafer industry, the U.S. is in the first and fourth quadrants, where high production costs will not be a consideration and a certain amount of domestic production capacity must be maintained. The third quadrant is for industries with low political and economic considerations, such as domestic service industries, which are less likely to be affected by globalization. The second quadrant is the industry with low political consideration but high economic consideration, and the metal fastener industry belongs to this category, unless it is a very special fastener product, the general metal fastener product has high interoperability and low production threshold, and the main consideration is still economic factors, which are just price, freight, insurance, quality, and delivery time. This type of industry is less likely to be affected by political factors.

Since 2018, when the U.S. began to implement de-sincization, Taiwan's exports of metal fasteners (HS Code 7318) to the U.S. have increased year after year, accounting for 32.19% of the annual import value of the U.S. in 2018 and increasing significantly to 39.22% in 2022, an increase of 7.03%, while China accounted for 26.96% of the annual import value of the U.S. in 2018 and decreased significantly to 21.68% in 2022, a decline of 5.28%. It is worth observing that India also grew by 1.28% and Vietnam increased by 1.02% from 2018 to 2022, and the fastener industries in India and Vietnam also benefited from the dividends of de-Chineseization. In the article "Analysis of U.S. Steel Fastener Procurement Trends in 2022" in issue no. 193 of Fastener World Magazine, the author analyzed the percentage of steel fasteners exported to the U.S. from 2018 to





will be supplied by the "global supply chain" based on economic considerations. The defense industry in the fourth quadrant will remain in the domestic market or within the "regional supply chain" to ensure national security. The third quadrant is for domestic service industries, which will also remain in the "regional supply chain. **The second quadrant of industry is the industry with low political consideration but high economic consideration, the main consideration is just price, freight, premium, quality, delivery, etc. This type of industry is less affected by political factors. The metal fastener industry belongs to this category.**

2021 from Mexico and Canada, two countries neighboring the U.S. What was more surprising at that time was that Canada and Mexico, two American countries belonging to the "U.S.-Mexico-Canada Agreement" with the U.S., did not gain any significant change in the trade war between China and the U.S. This article reorganizes THE PREMIER SOURCE OF FREE U.S. TRADE & TARIFF data as the following **Table 1**, the statistical comparison table of U.S. imports of steel fasteners (including customs value, insurance plus freight) from 2018 to 2022. Canada has improved from the 5th place in 2018 to the 4th place, surpassing the value of Germany's imports, and after removing insurance and freight costs as shown in **Table 2**, the value of U.S. imports of steel fasteners (customs value) statistics for 2018 to 2022, Mexico also surpassed Thailand to advance to rank 9<sup>th</sup>. We found a phenomenon, the share of both Canada and Mexico after deducting customs and insurance fees is increased. **Table 3** is the 2022 U.S. imports of steel fasteners (including Customs value, insurance fees and freight) statistics. Under the "U.S.-Mexico-Canada Agreement", Canada's freight, insurance and total value is 1.59%, while Mexico's is only 1.19%. Compared with Taiwan's 9.58% and China's 12.57%, the competitive difference is very obvious. The distance between each country and the U.S. affects the freight and insurance costs, and most importantly, the delivery time, and there is a high degree of uncertainty in long-distance transportation.

Under the high uncertainty, if the four quadrants of the industry differentiation diagram in Graph 1 are applied to the "flexible supply chain", the first quadrant will sacrifice some of the economic considerations in favor of political considerations, for example, chip production. The country must have enough capacity to produce, so that if foreign production stops, domestic factories can be self-sufficient, therefore, 20-30% of the capacity will be retained in the country or within the "regional supply chain", while 70%



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Table 1. Value Statistics of Steel Fasteners (with Customs Value, Insurance plus Freight) Imported into the U.S. from 2018 to 2022

Ranking	Country	2018	%	2019	%	2020	%	2021	%	2022	%
1	Taiwan	1,928,969,964	32.19%	2,009,366,352	34.64%	1,875,229,691	37.18%	2,506,624,781	38.15%	3,346,757,055	39.22%
2	China	1,615,487,368	26.96%	1,185,139,766	20.43%	891,759,608	17.68%	1,259,600,475	19.17%	1,849,913,370	21.68%
3	Japan	642,582,696	10.72%	647,146,935	11.16%	523,223,374	10.37%	656,791,486	10.00%	617,905,248	7.24%
4	Canada	312,235,647	5.21%	314,975,781	5.43%	263,567,711	5.23%	327,139,317	4.98%	393,212,212	4.61%
5	Germany	341,943,313	5.71%	378,166,781	6.52%	340,364,351	6.75%	381,745,637	5.81%	384,795,994	4.51%
6	S. Korea	197,341,884	3.29%	197,555,550	3.41%	182,615,830	3.62%	229,495,662	3.49%	314,433,956	3.68%
7	India	123,671,349	2.06%	155,591,468	2.68%	116,187,070	2.30%	203,534,381	3.10%	285,296,633	3.34%
8	Italy	158,239,578	2.64%	148,593,770	2.56%	141,909,343	2.81%	178,410,313	2.72%	206,137,217	2.42%
9	Thailand	84,143,941	1.40%	88,306,404	1.52%	78,694,789	1.56%	95,714,790	1.46%	176,714,181	2.07%
10	Mexico	120,917,513	2.02%	131,152,331	2.26%	111,511,056	2.21%	131,098,766	2.00%	172,535,873	2.02%
11	Vietnam	30,747,744	0.51%	67,520,323	1.16%	76,314,646	1.51%	93,360,569	1.42%	130,839,266	1.53%
12	UK	81,695,938	1.36%	89,095,313	1.54%	84,129,809	1.67%	87,721,107	1.34%	110,590,240	1.30%
13	France	86,159,248	1.44%	88,615,375	1.53%	71,561,522	1.42%	70,925,866	1.08%	96,241,000	1.13%
14	Türkiye	18,043,711	0.30%	21,502,088	0.37%	25,356,702	0.50%	35,256,760	0.54%	41,956,798	0.49%
15	Malaysia	12,467,256	0.21%	22,623,965	0.39%	18,223,516	0.36%	20,812,882	0.32%	38,866,843	0.46%
Total		5,991,586,997	100%	5,800,546,408	100%	5,044,285,484	100%	6,569,951,870	100%	8,533,134,790	100%

Table 2. Value Statistics of Steel Fasteners (Customs Value) Imported into the U.S. from 2018 to 2022

Ranking	Country	2018	%	2019	%	2020	%	2021	%	2022	%
1	Taiwan	1,826,392,563	32.06%	1,898,110,495	34.42%	1,763,443,580	36.92%	2,270,733,865	37.56%	3,026,244,255	38.99%
2	China	1,510,243,283	26.51%	1,103,255,287	20.01%	823,535,337	17.24%	1,117,955,386	18.49%	1,617,389,960	20.84%
3	Japan	619,458,463	10.87%	624,106,563	11.32%	505,554,216	10.58%	622,101,237	10.29%	571,048,216	7.36%
4	Canada	307,342,476	5.39%	310,118,812	5.62%	259,224,202	5.43%	321,911,024	5.32%	386,969,665	4.99%
5	Germany	328,629,533	5.77%	365,144,852	6.62%	328,235,862	6.87%	365,780,816	6.05%	366,733,296	4.72%
6	S. Korea	188,328,734	3.31%	188,010,515	3.41%	173,272,254	3.63%	213,442,822	3.53%	288,335,876	3.71%
7	India	115,109,230	2.02%	145,430,173	2.64%	107,379,668	2.25%	182,824,782	3.02%	247,151,596	3.18%
8	Italy	152,441,222	2.68%	143,870,889	2.61%	137,477,996	2.88%	170,556,326	2.82%	195,570,783	2.52%
9	Mexico	119,621,412	2.10%	129,850,777	2.35%	110,273,107	2.31%	129,234,904	2.14%	170,488,063	2.20%
10	Thailand	80,006,836	1.40%	83,305,952	1.51%	73,556,568	1.54%	86,692,672	1.43%	161,305,286	2.08%
11	Vietnam	28,544,698	0.50%	62,363,566	1.13%	69,951,662	1.46%	83,047,596	1.37%	116,124,982	1.50%
12	UK	79,406,752	1.39%	86,792,389	1.57%	81,991,739	1.72%	84,773,327	1.40%	105,952,153	1.37%
13	France	84,088,878	1.48%	86,510,079	1.57%	69,615,455	1.46%	68,863,679	1.14%	93,216,451	1.20%
14	Türkiye	17,229,053	0.30%	20,475,539	0.37%	24,528,842	0.51%	33,954,965	0.56%	39,880,808	0.51%
15	Switzerland	32,619,334	0.57%	31,312,302	0.57%	28,830,318	0.60%	31,781,231	0.53%	35,770,031	0.46%
Total		5,697,162,435	100.00%	5,513,839,560	100.00%	4,776,807,395	100.00%	6,045,906,942	100.00%	7,761,793,673	100.00%





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Under the consideration of supply chain disruption, some of the products may be retained in the "regional supply chain", while 80% to 90% of the products will still adopt the "global supply chain" model and continue to be purchased based on price and efficiency. Inferred from this model, the U.S. metal fastener procurement will retain 10% to 20% in the regional supply chain. In 2022, Canada shared 4.61% of the U.S. metal fastener imports and Mexico shared 2.20% (both totaling 6.81%). These two countries still have a lot of room for development. Canada can replace Europe's high-priced metal fasteners and Mexico can replace the general low-priced metal fasteners, causing some impact on Taiwan's fastener exports to the United States.

As geopolitics increasingly affects global free trade, multinational companies and governments are alarmed that investment layout can no longer be considered as in the past, only in the lower cost or more profitable areas of production, and then under the consideration of "flexible supply chain", world trade will be different industries, that is, industries belonging to different quadrants will adopt a proportional distribution between the "global supply chain" and "regional supply chain" for procurement. The strategy is also called "flexible supply chain" thinking. **The freight and insurance costs of Taiwan's metal fasteners exported to the U.S. accounted for 9.58% of its sales. Compared to 12.57% in China, there is still a 2.98% surplus advantage; compared to India, there is also a 3.78% gap. As long as Taiwan metal fasteners can maintain a certain quality and price, it is expected that the sales volume in the U.S. can still retain its glory for several years. On the other hand, it is suggested that Taiwan fastener manufacturers should observe the investment opportunities in Mexico.** Among the countries importing into the United States, Mexico is the region with the lowest transportation and insurance costs, plus Mexico is a tariff-preferring country under the "U.S.-Mexico-Canada Agreement" and has low land and labor costs. In recent years, the world's major automobile manufacturers have made new investments in Mexico. Under the huge demand increase, the metal fastener industry in Mexico is expected to rise rapidly, whether Taiwan fasteners should consider increasing investment in Mexico will be an important decision for business strategy.

**Table 3. U.S. Imported Steel Fasteners Freight and Insurance Rates by Country, 2022**

Ranking	Country	2022[incl. freight and insurance]	2022[Customs Value]	Difference	% of Freight and Insurance
1	Taiwan	3,346,757,055	3,026,244,255	320,512,800	9.58%
2	China	1,849,913,370	1,617,389,960	232,523,410	12.57%
3	Japan	617,905,248	571,048,216	46,857,032	7.58%
4	Canada	393,212,212	386,969,665	6,242,547	1.59%
5	Germany	384,795,994	366,733,296	18,062,698	4.69%
6	S. Korea	314,433,956	288,335,876	26,098,080	8.30%
7	India	285,296,633	247,151,596	38,145,037	13.37%
8	Italy	206,137,217	195,570,783	10,566,434	5.13%
9	Thailand	176,714,181	161,305,286	15,408,895	8.72%
10	Mexico	172,535,873	170,488,063	2,047,810	1.19%
11	Vietnam	130,839,266	116,124,982	14,714,284	11.25%
12	UK	110,590,240	105,952,153	4,638,087	4.19%
13	France	96,241,000	93,216,451	3,024,549	3.14%
14	Türkiye	41,956,798	39,880,808	2,075,990	4.95%
15	Malaysia	38,866,843	35,770,031	3,096,812	7.97%

