

Research on the Effect of Rise in US Tariff on China's Import and Export Trade

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Abstract: This essay researches the impact of the rise in US-China tariff the trade of Chinese imports and exports, using different methodologies or equations from different researchers. After 2018, the United States began to impose increasing amounts of tariffs on imported commodities from China with approximately 10% and 25% on different volumes of products, which indeed affects the Chinese trade market status and GDP. This paper will not only discuss the implications, but also discuss the results of future trends and relationships between the United States and China after the release of the tariff policy. From the research, complicated effects with multiple aspects will be caused by the alternation of tariffs. The most obvious implications are definitely Chinese GDP, as tariff increases the price of exported products to consumers from the United States and decline affordability of Chinese goods to them. Thus, the net export will reduce as a component of GDP. However, some researchers observe that Chinese exporters still maintain the same level of volume of goods to the US because they quickly reduce the shipment before the implementation date of the tariff policy.

Keywords: Tariff, Import and export trade, Trade war, GDP

1. Introduction

Tariff, refers to a sort of tax imposed by a government or national organization on the imported and exported commodities, acting as an effective political means to protect domestic goods from foreign competition and raise government revenue. Since the beginning of 2018, the United States and China began to impose higher tariff rates on each country's imported goods, contributing to a trade war between these two nations. The US government adopted an increase in tariff rates of 25 percentage points on \$50 billion in commodities and 10 percentage points on \$200 billion in commodities imported from China. This alternation indeed contributes to the ascendancy in economic downturn in China, the fundamental reason is that a rise in tariffs will increase the price of the imported goods produced by China, leading American consumers to possess less demand for imports of China. While, insights on the long-term implications result from the rise in US tariffs, there are several channels to affect the multiple factors through this political change and the continuous fluctuation, not merely influencing the Chinese trade market. Initially, a tariff increase will impose a detrimental effect on consumption and investment due to a higher tax. Secondly, the production output will also be negatively affected as a result of the disruption of international supply chain given the pivotal role of China in global value chains. Moreover, the tenaciously higher level of tariff rate will drastically deplete the production capacity of Chinese trade economy and exported industries. However, the increase in tariff rates can help with protection of domestic products in the United States, and can

slow down capital accumulation since the wealth effect resulting from increasing investment of assets will be limited, which can reduce extent of market competition.

The study will investigate the effect of rise in US tariff on China primarily in terms of export and import market. It will research whether the higher tariff rates will exert downward pressure on the production industries in China and extend this topic further into the potential effect of other aspects of the Chinese economy and even the global economy.

2. Previous studies about the influence of tariffs on economy

The effects of raising tariffs on foreign trade industries primarily show in the prices of imports and exports and the overall volume of trade, which is commonly referred to as tariff pass through, in the domain of international trade research where some agreement has been reached on the subject[1]. One key point to notice is that when the demand for imports and the supply of exports are not infinitely elastic or completely inelastic in response to tariff adjustments, the import prices will affect both importers and exporters together in terms of costs or benefits outcomes, which may impact trade volumes and pricing accordingly based on the elasticity of supply and demand curves principle. The theory mentioned above was proven comprehensively during the period of trade liberalization and China serves as an illustration of this phenomenon[2]. With its entry into the World Trade Organization (WTO) China notably decreased its import tariffs resulting in a decrease in import costs and then a remarkable surge in import quantities along with an expansion in the range of available goods[3]. Besides, recent research further indicates that China's tariff cuts on imports contributed to a lower import price and higher export price from 2001 to 2010[4].

The researchers delve further into how tariffs imposed by the United States on products impact the economy and pose threats to trade factors to China. Surprisingly, according to studies, Faigelbaum et al[5] found that US importers mainly bore the burden of the tariffs on products resulting in price fluctuations from Chinese exporters because Chinese export prices almost maintained the same level. At that time, they referred to the pass-through rate as approaching 1. Subsequently, they realized that in the condition of other countries imposing retaliatory tariff on the US, then the result is the consistent, which means the entire cost would transfer to their own imported prices. Besides, there are studies that compared the change in US tariffs rate and the change in foreign export prices through a regressive analysis, the researchers found that it is not sensitive or elastic for the export price to respond to the fluctuation in US imported tariffs, merely the import price would respond in a proportional trend[6].

Then, another key determinant impacted by the rise in US tariff rates is the trade volumes of China, the alternation of tariff rate will result in a further reduction in it. For example, studies from Fajgekbaum[5] revealed a 20 percent decrease in U.S imports and a 23 percent decrease in import volume within one month of implementing the tariffs. Additionally, Amiti[6] and other researchers discovered that a 1 percent rise in U.S tariffs led to a decline of 1.3 percent in import volume and 1.4 percent in import value within a years time. However, the research conducted by Cavallo[7] and team observed that the fluctuations in trade volume exhibited a trend of a rise followed by a subsequent fall. For instance, during 2018 and the first half of 2019 when the US raised tariffs, the two largest retail companies in the US actually increased their imports from China instead of decreasing them as one might expect with escalating tariffs. Especially, there was a jump in import quantities from 55,000 tons to 80,000 tons and the trend continued with import numbers peaking at 110,000 tons per month until the fourth quarter of 2019 when a decline started to proceed.

3. The effects of raising tariffs by United States on Chinese trade industries

The first table demonstrates the increase in tariffs by both the United States and China from the beginning of 2018 with Panel A showcasing the tariffs that have been put into effect and Panel B outlining those purposed for implementation in the future. The first three columns detail policy measures taken by the US government while columns four through six highlight actions undertaken by China[8].

The initial trade policy made by the United States involved a 28% tariff hike, on all imported panels and washing machines following requests from manufacturers in those sectors goaled for increased protections. It came into effect in January 2018, impacting every trading partner of the US, including China.

In March 2018 came the next update following an inquiry led by the US Secretary of Commerce that found that trade practices from foreign countries with the US seemd to pose a threat to the domestic security. As a result of this discovery and the Trade Expansion regulations, President Trump authorized an order to increase tariffs on steel imports by 25 percent and on aluminum imports by 10 percent respectively. Some nations were granted an extension period while the tariffs took effect for China on March 23 for \$ 3 billion, in imports. In response China raised tariffs by 15 to 25 percent on \$4 billion worth of products.

Table 1: Timeline of Trade Policies

		United States			China	
	Date (1)	Tariff hike (ppt.) (2)	Imports from China affected (\$bn) (3)	Date (4)	Tariff hike (ppt) (5)	Imports from U.S. affected (\$bn) (6)
A. Implemented						
1 Solar & washing mach.	1/22/18	28	1.4		-	-
2 Steel & aluminium	3/23/18	25&10	3.2	4/2/18	15-25	3
3 Sec.301; \$50bn (part 1)	7/6/18	25	34	7/6/18	25	34
3 Sec.301; \$50bn (part 2)	8/23	25	16	8/23/18	25	16
4 Sec. 301;\$180bn	9/24/18	10	180	9/2/18	5-10	60
5 Sec. 301; \$180bn *	5/10/19	15	180	6/1/19**	5-15	60
Total (1-5)		24.9**	234.6		19.6**	113
B. Proposed						
6 Remaining \$275bn	-	25	275	-	25**	17
Total (1-6)		24.9**	509.6		20.3**	130

From the first column to the sixth column, following the instruction and list of data displaying in the table, we can witness that the entire trend of the increase in tariff rates in both the US and China will both affect a corresponding increase in amount of imported goods from the other nation being affected.

Table 2: Cumulative Effect on Real GDP Growth and Trade

	China real GDP (pct.) (1)	U. S real GDP (pct.) (2)	China's exports to the U.S (pct.) (3)	China's exports to the U.S (bn USD) (4)	China's imports from the U.S (pct.) (5)	China's imports from the U.S (bn USD) (6)
A. Implemented						
1. Solar & washing mch.	-0.00	-0.00	-0.5	-2	-2	-3
2. Steel & aluminum	-0.02	-0.01	-0.9	-4	-2	--3
3. Sec.301 - \$50bn	-0.11	-0.10	-14	-67	-25	-34
4. Sec.301 - \$180bn (10%)	-0.17	-0.14	-23	-111	-33	-45
5. Sec.301 - \$180bn (25%)	-0.25	-0.19	-33	-159	-43	-58
B. Proposed						
6. Remaining \$275bn (25%)	-0.39	-0.31	-54	-260	-59	-80

In conclusion, according to this analysis of model, the currently implemented tariffs are expected to have a limited impact, showing in line 5, decreasing the real GDP level in China by 0.25 percent in column 1. The adverse impact primarily arises from a decline in exports to the United States due to tariffs imposed on imports from China , resulting in higher prices for American consumers and manufacturers on Chinese products and consequently reduce the demand for Chinese goods by approximately 33 percent or \$159 billion as indicated in columns 3 and 4.

However, the researches conducted by Yang Ding and Yuanchun Liu[9] showed a slightly different views resulting from different methods. In 2018, there are more than 500 enterprises exporting goods and services to the US, based on the different corperation running strategies from each firm, they established the equation below to evaluate the implication of tariff hikes:

$$\ln y_{ijct} = \alpha_0 + \alpha_1 Treat_i + \alpha_2 Time_t + \alpha_3 TT_{it} + \sum \beta X_{it} + \gamma_{jt} + \gamma_{ct} + \gamma_{jc} + \varepsilon_{ijct} \quad (1)$$

The i represents the whole enterprise with a total of 800; the notation j stands for the product with a total of 244 based on HTS8; c means the destination nations; t is the time period ranging from 2017 to 2018. The variable $\ln y_{ijct}$ can be split into the logarithm of the export price and export volume of the priority products.

As the first equation only measures the influence of tariff on the first-priority products instead of taking all the market commodities into account, the researchers come with a second production equation below:

$$\ln val_{it} = \alpha_0 + \alpha_1 Treat_i + \alpha_2 Time_t + \alpha_3 TT_{it} + \sum \beta X_{it} + \varepsilon_{it} \quad (2)$$

In this equation, $\ln$ y means the logarithm of the entire value of output, which represents this equation can calculate the whole market of exported goods.

Table 3: Combined Impact of Tariff Increase from 2018 to 2019

		Export price	Export volume	Total output	Num of employee	Per capita wage	Per capita welfare
		Model 25	Model 26	Model 27	Model 28	Model 29	Model 30
Full sample	<i>TT</i>	-0.003 (-0.17)	0.032(0.88)	-0.049* (-1.82)	0.020(0.98)	0.012(0.71)	-0.129*** (-6.86)
	<i>obs</i>	1468	1465	1442	1468	1429	1429
	<i>R-</i>	0.248	0.414	0.102	0.145	0.228	0.454
	<i>sq</i>						
		Model 31	Model 32	Model 33	Model 34	Model 35	Model 36
Without domestic sale enterprises	<i>TT</i>	0.005 (0.70)	-0.069** (-2.26)	-0.052* (-1.79)	0.022(0.99)	0.006(0.30)	-0.144***(-4.82)
	<i>obs</i>	916	915	916	916	910	910
	<i>R-</i>	0.481	0.436	0.146	0.215	0.249	0.592
	<i>sq</i>						

The table 3 displays the regression outcomes for each equation. It can be confirmed that the earlier findings are remaining valid. While the new dataset examined the tariff hikes did not remarkably affect the export price and volume of products, there was a 4.9% decline in output value, no significant shifts were observed in employee count and average wage per person but per capita welfare witnessed a decrease of 12.9 %. After the removal of businesses, from the equation the tariff hikes still did not manage to affect the selling prices of the key products for export significantly, however they did result in a 6.9% decline in export quantity and a 5.2% reduction in production.

4. Discussion and suggestions

The findings of this research highlight the implications of rising US tariff on China's import and export trade market. Besides the immediate consequence of decline in sales volume between the two countries, the contiguous effects will constantly extend to global market of supply chains, consumer costs, and economic expansion in both countries. To deal with this problem, the policymakers ought to realize that trade issue are intercorrelated by market dynamics that can disrupt the entire markets. Future researches should take long-term strategies into consideration that minimize such costs by focusing on trade partnerships and fostering domestic economic restoring capabilities.

To minimize the detrimental effects, Chinese cooperations could properly use approaches by transformation toward novel industries and increasing independency on exports to the United States market. At the same time, establishing a stronger and more solid partnership relationship with developed countries and economies could properly serve as a cushion and aid when it comes with economic losses. From the US perspective, properly promoting relatively fair trade practices through multiple agreements could lead to more sustainable economy. Collaboration such as negotiating trade patterns and positive comparison with other nations may prove more effective economic growth. In conclusion, while the rise in US tariffs presents potential problems to China's import and export trade, it also offers opportunities for strategic alternation and recovery. By introducing sophisticated

technology and international integration, both nations can predict the potential trade conflicts so that they can guarantee a more stable economic environment.

5. Conclusion

From this study, it uses the survey data from the trade policies alternating with changes in tariffs export and the equations related to the key products and the entire exported products to analyze the impact of the US tariff increases on Chinese trade economy from 2018 to 2019, during the trade war between the US and China. In conclusion, there are slightly various insights of the event due to different aspects. The first method of analysis concludes the normal analysis of the implication that Chinese economy is negatively impacted by reducing the export output to the American consumers and raising prices to them, resulting in a lower level of real GDP in China. While the conclusion drawn by the multiple equations says that the impact of the tariff increases on exports is primarily reflected in volume of the export instead of export price. The tariff increase from the United States government in 2018 didn't bring a remarkable effect on the export price, and the value of exported goods even increased by nearly 10% due to determinations such as front-run and expected factors.

These findings indeed contribute to a better understanding of the implication of China's trade industries through the alternation of the United States government, which can help the Chinese exporter to better prepare for the future fluctuation with regard to the further change in tariff rates. In addition, it can be seen that the previous event and observed political change stem from the relationship between China and the United States, it is acknowledged that an increase in tariffs in the US will also cause the same increase in tariffs in China, resulting in a temporarily worse trade relationship between these two countries.

References

- [1] R.C. Feenstra, *Symmetric pass-through of tariffs and exchange rates under imperfect competition: an empirical test*, *J. Int. Econ.*, 27 (1) (1989), pp. 25-45.
- [2] K. Head, J. Ries, *Rationalization effects of tariff reductions*, *J. Int. Econ.*, 47 (2) (1999), pp. 295-320.
- [3] P. Sun, T. Zhang, *External demand, tariff pass-through and price of consumer goods*, *J. World Econ.* (6) (2019), pp. 47-71.
- [4] H. Wei, W. Zhang, *Import tariff adjustment, pass-through effect and import prices of Chinese firms*, *China Economic Q.* (3) (2022), pp. 933-953.
- [5] P.D. Fajgelbaum, P.K. Goldberg, P.J. Kennedy, A.K. Khandelwal, *The return to protectionism*, *Q. J. Econ.*, 135 (1) (2020), pp. 1-55.
- [6] M. Amiti, S.J. Redding, D.E. Weinstein, *The impact of the 2018 tariffs on prices and welfare*, *J. Econ. Perspect.*, 33 (4) (2019), pp. 187-210.
- [7] A. Cavallo, N.B. Gopinath, G. Jenny, *Tariff pass-through at the border and at the store: evidence from US trade policy*, *Am. Econ. Rev.: Insights*, 3 (1) (2021), pp. 19-34.
- [8] Ferraro, John K., and Eva Van Leemput (2019). "Long-Run Effects on Chinese GDP from U.S.-China Tariff Hikes," *FEDS Notes*. Washington: Board of Governors of the Federal Reserve System, July 15, 2019, <https://doi.org/10.17016/2380-7172.2382>.
- [9] Yang Ding, Yuanchun Liu, *The Impact of tariff increase on export and employment of Chinese firms*, *China Economic Q.*(3) (2023), pp. 155-166.