The Research on the Influence of Trade War on the Sino-US Route

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Abstract

This paper focuses on the fluctuation of Sino-US routes under the influence of trade war, and studies the follow-up development of Sino-US routes after and after the trade war. The study will reflect the fluctuation of route development through the changes of shipping companies and freight rate index.Through the study of the change of the course, the development trend of the next wave of the Sino-US course is predicted.At the same time, this paper focuses on the main research on the freight rate between China and the United States before and after the trade war, uses SPSS software to carry on the significance test, carries on the data comparison inspection to the freight rate fluctuation, and then unifies the existing research result, gives the suggestion on how to strengthen our own shipping strength, expects our country shipping to be better able to deal with the adverse influence of the external factor similar to the trade war in the development.

Keywords

Trade war; Sino-US route; Development trend; Freight rate; Suggestion.

1. Introduction

In the economic and trade activities of China and the United States, the emergence and change of trade friction is an inevitable and important problem. As China's strength in commodity exports continues to grow, the inferiority of high value-added goods makes dumping disputes occur frequently, and the degree of trade frictions between China and the United States is escalating.In March 2018, the United States announced tariffs on about $60 billion worth of goods exported to China, officially opening the prelude to the trade war between China and the United States.

In the present moment of the development of the world's unilateral trade, the shipping market is affected by the economic change, resulting in the inevitable fluctuation.As the center of contradiction, China and the United States have suffered inevitable setbacks in their routes.China and the United States, as the first and second-largest economies of the world, are not allowed to trade with each other, and the trade and transport of large quantities of goods depend on the guarantee of the course between China and the United States.After more than 40 years of development, the Sino-US route has developed rapidly from a small scale to a trunk line. The main ports along the route include Shanghai, Xiamen, Shenzhen, Qingdao, located on the west coast of the United States, long Beach, Los Angeles, Auckland, etc., as well as New York, Houston, Savannah and so on the east coast of the United States.

Therefore, under the condition of slow recovery of the world shipping market, the trade friction between the giants of the two economies is enough to affect the operation of a trunk route, which is very disadvantageous to the shipping development of the country, which reflects not only the development problem on a route, but also the problems in the process of shipping development through a contradiction.

2. Literature References

2.1 Domestic and Foreign Studies on the Development of Sino-American Routes and Ports and the Development of Ports

The earliest opening of Sino-US routes can be traced back to 1979. After the formal establishment of diplomatic relations between China and the United States, China's just-started container transportation developed rapidly between China and the United States. By the end of 2018, the volume of container transportation on Sino-US routes accounted for 4.7% of the total global container transportation. The goods on Sino-US routes included bulk groceries dominated by grain and various containers.[1][2]

Peng Chuansheng(2010)[3] believes that the state of shipping reflects the microcosm of the economic state and exchange between China and the United States. As a basic industry, the shipping industry is a service industry. Its development is not only dependent on but also limited to the development of trade between the economy and the world. In the past period of economic globalization, China has rapidly developed port and shipping enterprises and shipbuilding industry, making the shipping industry difficult to restore the original development state and realize the rapid development after the economic crisis in China's long-term development state. The shipping industry between China and the United States will enter a new cycle.

Alan w. Cafruny (1985)[4] found that the maritime shipping conflict (liner) originated from the development of the world's political process, while the instability of international shipping was not determined by the change in the U.S. shipping right or the change in the shipping pattern, but on the United States' strong identity between the existing system and the short-term interests.

2.2 A study on the existing influence of domestic Trade War

Liu Jun (2018) [5] concluded that the Sino-US trade war will have different effects on oil, bulk, container transport and other segments of the market. The uncertainty brought about by the trade war distorted the freedom of movement of goods, changed the trade routes, and the long-anticipated recovery in the shipping market was also affected. In this situation, Chinese shipping enterprises should be treated with caution, broaden the global layout, and flexibly cope with the change of the demand for transportation through the capacity configuration, and meanwhile, by means of the national development strategy of participating in the activities and "Belt-Road" of the international conferences, the enterprises in all parts of the world will be connected. Seek new sources of goods to balance the volume of import and export, and gradually shift the capacity, thus eliminating the potential impact of the trade war.

The editorial department of Zhujiang Shipping[6] holds that 60% shipping enterprises may be affected and impacted by the occurrence of trade war, among which container shipping enterprises are more likely to be affected by trade war, while dry bulk shipping gold industry and port enterprises generally believe that their own business is not greatly affected by trade war.According to the investigation and analysis, Shenzhen, Shanghai, Zhoushan and other ports with concentrated American routes were impacted greatly.Based on the different industrial structure of each region, the distribution of the route is different, and the influence of the trade war is different, but in the estimation of the forecast, the overall level is at a controlled level.

Zhang Tao (2018)[7] believes that the trend of the trade war is still unclear and depends on the follow-up policies and responses of China and the United States. Moreover, the collection of important goods on the far East-North American route is greatly affected by the tariff list issued in March, and there are still variables in the development.In order to deal with the fluctuation of shipping industry, it is necessary to make joint efforts and cooperation in many aspects. In the shipping industry, the shipping enterprise should set up a risk control mechanism in the event of a significant event to deal with the economic hypochondriac that may occur at any time, and take a positive note of the development in the event of an incident so that the adjustment and response should be made in a timely manner: In

that economic and trade level, the economic main body should work actively, fight against the trade friction, and fight the unilateralism.

Based on the above literature, it can be seen that the opening and development of routes between China and the United States have been of great origin for a long time, while the international shipping market has variability and instability under the influence of economy. Due to the short time of events and the uncertainty of the situation, the number of studies is not many.Therefore, through study, reference and research, this paper will combine the analysis of previous scholars with the development of the current trade war, compare the level of freight rates between China and the United States, the reaction and adjustment of major shipping enterprises to the trade war, synthesize the social views and forecasts on the events, and study the impact of the trade war on the Sino-US routes.

3. The importance of the Development of Shipping between China and the United States for the Trade exchanges between the two countries

China and the United States are separated from the Pacific Ocean, so shipping is the most important mode of transportation between China and the United States, and the development of Sino-US routes ensures and meets the trade needs of the two countries to the greatest extent.In 2017, China's total exports to the United States reached US $429.73 billion. At the same time, China's total imports from the United States reached US $153.9 billion, and the total import and export volume between the two countries reached US $583.68 billion.As shown in Table 1 and Table 2：

Table 1 Bilateral trade volume between China and the United States (Unit:$100 million)

Year	China's exports to the United States	China imports from the United States	Total bilateral imports and exports between China and the United States
2007	2326.77	693.91	3020.67
2008	2523.84	813.60	3337.43
2009	2208.02	774.60	2982.63
2010	2832.87	1020.99	3853.85
2011	3244.53	1221.29	4465.82
2012	3517.77	1328.97	4846.74
2013	3684.06	1523.42	5207.49
2014	3960.63	1590.61	5551.24
2015	4902.14	1478.09	5570.23
2016	3852.71	1344.45	5197.16
2017	4297.30	1539.46	5836.76

Table 2 Status of Chinese imports from the United States(Unit:$100 million)

Year	China imports from the United States	China's total imports	Proportion of China's imports	Total United States exports	Proportion of US exports
2007	693.91	9561.15	7.26%	11482	6.04%
2008	813.60	11325.62	7.18%	12874.4	6.32%
2009	774.60	10059.23	7.70%	10560.4	7.33%
2010	1020.99	13962.47	7.31%	12784.9	7.99%
2011	1221.29	17434.84	7.00%	14802.9	8.25%
2012	1328.97	18184.05	7.31%	15457.1	8.60%
2013	1523.42	19499.89	7.81%	15790.5	9.65%
2014	1590.61	19592.35	8.12%	16234.1	9.80%
2015	1478.09	16795.64	8.80%	15045.8	9.82%
2016	1344.45	15879.26	8.47%	14583.3	9.22%
2017	1539.46	18437.92	8.35%	15467.3	9.95%

Table 3 Status of Chinese exports to the United States(Unit:$100 million)

Year	China exports from the United States	China's total exports	Proportion of China's exports	Total United States imports	Proportion of US imports
2007	2326.77	12200.60	19.07%	20204	11.52%
2008	2523.84	14306.93	17.64%	21694.9	11.63%
2009	2208.02	12016.12	18.38%	16053	13.75%
2010	2832.87	15777.54	17.96%	19691.8	14.39%
2011	3244.53	18983.81	17.09%	22658.9	14.32%
2012	3517.77	20487.14	17.17%	23365.2	15.06%
2013	3684.06	22090.04	16.68%	23290.6	15.82%
2014	3960.63	23422.93	16.91%	24125.5	16.42%
2015	4092.14	22734.68	18.00%	22482.3	18.20%
2016	3852.71	20976.31	18.37%	22501.5	17.12%
2017	4297.30	22633.71	18.99%	23429.10	18.34%

(Data Source: Ministry of Commerce of the people's Republic of China http://opendata. mofcom. gov.cn/front/data/?t=1)

China and the United States, as the world's largest and second largest economies, are also very important trading partners with each other.Comparing the bilateral trade situation from 2007 to 2017, it can be seen that the volume of trade between China and the United States, excluding the impact of the economic crisis, maintains a steady growth trend year by year.Take 2017 as an example, China's annual import and export trade with the United States reached US $583.676 billion, an increase of 12.3 percent over the same period last year, of which US exports to the United States were US $429.73 billion, accounting for 18.99 percent of China's total exports and 18.34 percent of US imports for the whole year.Imports from the United States totaled $153.946 billion, accounting for 8.35 percent of China's total imports for the whole year and 9.95 percent of total U.S. exports for the whole year.

At the same time, compared with the volume of import and export trade between China and the United States, the volume of trade imported by China to the United States far exceeds that imported from the United States, there is a large trade surplus, and China is more dependent on the export of the United States.

4. The influence of Trade War on Shipping Market and Sino-US routes

4.1 The influence of Trade War on Shipping Market

The trade war makes the economic market change, and the development of shipping industry and the trend of economy are inseparable, and the development trend and characteristics of shipping industry correspond to the situation of economy.Therefore, the prosperity of the shipping market reflects the fluctuation of the economic market and the stock market.

As an example of the impact of the economic market on the shipping market over the past decade, a series of consequences of the U.S. sub-loan crisis can be regarded as the most obvious and most significant. After the 2008 economic crisis, the world economy was depressed, and the shipping market was hit hard.

Based on the BDI index, the BDI index reached a high of 11033 points at the end of October 2007, during which the world economy was in a period of stability and prosperity.In the wake of the 2008 financial crisis, the BDI reached an all-time low of 824 in a year.At the same time, the U. S. 's Dow Jones index fell in a relatively slow-up mode, confirming that the global trade depression was rapidly

reflected in the shipping market.In the next few years, despite the efforts of countries to save capital invested in the city, the bubble in financial markets has made the BDI index volatile and has again experienced several slow rises and sudden declines. The cold winter of the shipping market came from the financial crisis and has not recovered from the past ten years, with the BDI index at 1282 as of January 1, 2019. As shown in figure 1:

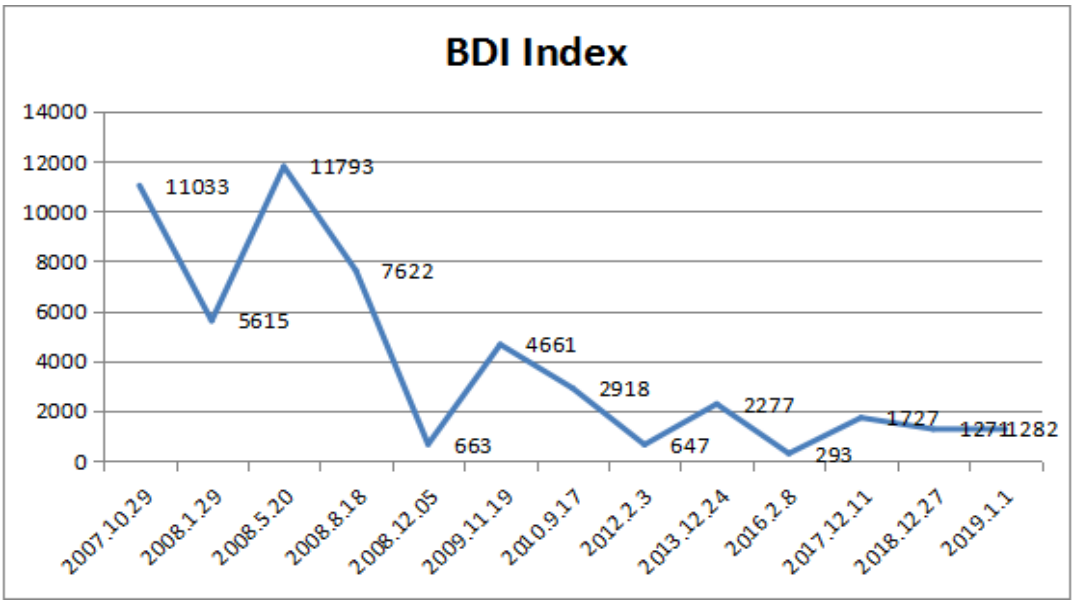

Figure 1 Trend chart of BDI index from 2007 to 2019

(Data Source: China Maritime Service Network http://www.cnss.com.cn/exponent/bdi/)

4.2 The impact of Trade War on World Shipping Market

Table 4 proportion of affected trade volume to overall seaborne trade volume

(Unit: millions of tons)

Type		Total	Between China and the United States	Account for the total volume of global maritime trade
Dry bulk cargo	Commissariat	40.8	39.9	0.4%
	Coal	5.1	3.2	0.04%
	Steel products	22.3	1	0.20%
	Small bulk cargo	22.9	18.2	0.20%
Container		82.6	80.8	0.70%
Oil	Crude oil	7.7	7.7	0.10%
	Product oil	1.6	1.6	0.01%
Motor vehicle		5.8	0.9	0.05%
Liquefied natural gas		1.5	1.5	0.01%
Liquefied petroleum gas		3.5	3.5	0.03%
Chemical		1.3	1.3	0.01%

(Data Source: Clarkson)

Sino-US trade is not only large, rapid development, but also a rapid growth in the share of world trade.Referring to the report of the Shanghai International Shipping Center on Sino-US trade, the market share of Sino-US trade in total world trade was only 0.8 percent in 1995, and by 2016 it had steadily risen to 3.3 percent.It can be seen that Sino-US trade accounts for the most important part of the world trade market.CNBC interviewed economist Paul Gruenwald, In his forecast, he believes

that global economic growth may decline by about 1 percent in the event that the tariff dispute turns into a trade war.From the factors affecting the demand of the shipping market, it can be inferred that the decline in world trade will be reflected in the demand for capacity in the shipping market.

4.3 Affected cargo on Sino-US routes

Table 5 Overview of Sino-US Maritime Trade 2017 (Unit: millions of tons)

Large category of goods	Breakdown of goods	Volume of trade imported into the United States	Proportion of China's total imports	Volume of trade exported to the United States	Proportion of total imports to the United States
Container	Container	23.3	6.4%	62.2	37.4%
Dry bulk cargo	Iron ore	0.7	0.1%	0	0.0%
	Coal	3.2	1.4%	0	0.0%
	Small bulk cargo	4.9	1.5%	4.1	4.2%
	Commissari-at	39.9	34.4%	0	0.0%
Oil&Chemi-cal goods	Crude oil	7.7	2.0%	0.2	0.1%
	Product oil	0.7	2.4%	0.9	1.3%
	Chemical	2.1	3.7%	0.5	0.5%
Gas goods	LPG	3.5	19.4%	0	0.0%
	LNG	1.5	3.8%	0	0.0%

(Data Source: Clarkson)

According to Clarkson's statistics up to August 2018, the main areas affected by the trade war between China and the United States are the dry bulk and container cargo sectors, which are dominated by grain and steel.Taking 2017 data as a reference, China imported 98.8 million tons of goods from the United States in 2017, mainly soybeans and high canals, while LNG and LPG accounted for a large proportion of China's total seaborne imports from the United States over the same period.In 2017, the United States imported 97.9 million tons of goods from China, accounting for 37 percent of the total imports of container goods, accounting for 37 percent of the total imports.

4.4 Analysis of freight rate level from China to North America

Table 6 China Export Container tariff Index for Sino-US routes 2018-2019

Years	Index of freight rates for routes to the West of the United States	Shipping rate Index to East America
2018.03	633.82	879.03
2018.04	589.28	820.52
2018.05	631.86	862.07
2018.06	633.63	836.98
2018.07	632.77	830.38
2018.08	696.77	884.37
2018.09	781.87	958.02
2018.10	790.05	948.78
2018.11	835.91	1011.57
2018.12	806.71	1004.47
2019.01	717.32	894.4
2019.02	726.51	911.38
2019.03	673.73	864.41

(Data Source: Monthly Review of China's Export Container Market)

Through the above data analysis, after the beginning of the trade war, since March 2018, the general trend of changes in the freight rate index from China to North America has risen and fallen many times.Summing up the trend of freight rate change in the past year, it can be seen that the regular

season law of shipping market is still in effect, but under the influence of trade war, the shipping bias of consignor in the market has changed. With the shortage of trade war and easing the adjustment of shipping speed, the main phenomenon is that the consignor strengthens the shipment in order to avoid the tariff, although the demand of the prosperous feeling in the early stage makes the freight price rise all the way and the market demand is good.However, the amount of trade fees in the economic market is ultimately limited, and the consequence of early payment is the weakness of late demand, which has affected the change of freight rate in the Spring Festival of 2019 and the post-holiday talk season, making the freight rate fall all the way.

5. An Analysis of the Freight rates of Sino-US routes under the Trade War

5.1 Fluctuation of freight rate before and after trade war

As the test data, China's export container freight rate index, which lasted 24 months from April 2017 to March 2019, was tested in two groups: the West Coast rate of the United States and the East Coast rate of the United States.The two groups of data are divided into the starting rate of the trade war and the rate after the start of the trade war according to the annual month, and each part of the data takes 12 months as the timeline. The data classification is shown in Table 7.

Table 7 China Export Container tariff Index for Sino-US routes 2017-2019

Divide into groups	Years（n）	US-West Freight Index（X_1）	US-East freight index（X_2）
Before the start of the trade war	2017.04	611.05	853.71
	2017.05	682.76	847.42
	2017.06	623.38	846.10
	2017.07	635.97	840.74
	2017.08	647.87	865.69
	2017.09	643.72	847.85
	2017.10	614.60	795.64
	2017.11	629.06	787.08
	2017.12	605.59	770.81
	2018.01	618.46	819.29
	2018.02	642.55	906.47
	2018.03	633.82	879.03
After the beginning of the trade war	2018.04	589.28	820.52
	2018.05	631.86	862.07
	2018.06	633.63	836.98
	2018.07	632.77	830.38
	2018.08	696.77	884.37
	2018.09	781.87	958.02
	2018.10	790.05	948.78
	2018.11	835.91	1011.57
	2018.12	806.71	1004.47
	2019.01	717.32	894.4
	2019.02	726.51	911.38
	2019.03	673.73	864.41

The above data is tested for significance, the method for testing the independent sample T is selected according to the test which needs to be carried out,the freight rates of China to US-West and US-East are used as test variables.Then the statistics of independent sample T test are:

$$t=\frac{\overline{x_1}-\overline{x_2}}{\sqrt{\frac{(n_1-1)S_1^2+(n_2-1)S_2^2}{n_1+n_2-2}(\frac{1}{n_1}+\frac{1}{n_2})}}$$

Among them, n_1 and n_2 are the sizes of two samples, and S_1 and S_2 are the variances of the two samples, respectively.

The average sample is:

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$$

Set the percentage of signal interval to α = 95%,When the P value (Sig. value) obtained by the test is less than 0.05, there is a significant difference between the two groups.

The calculation of T test of the above independent samples is carried out by using SPSS software, and the calculated results are as follows:

Table 8 Group statistics

Groups		N	Mean value	Standard deviation	Standard error of mean value
US West Freight Rate	Before the trade war	12	632.4025	20.88857	6.03001
	After the trade war	12	709.7008	80.38041	23.20383
US East Freight Rate	Before the trade war	12	838.3192	39.19018	11.31323
	After the trade war	12	902.2792	65.56839	18.92796

Table 9 Test results of independent samples

		Levene Test of Variance equation		t test of mean equation		
		F	Sig.	t	df	Sig.(Bilateral)
US West Freight Rate	Assume that the equation is equal	17.684	0.000	-3.224	22	0.004
	Assume that the equation is not equal.			-3.224	12.479	0.007
US East Freight Rate	Assume that the equation is equal	3.997	0.058	-2.901	22	0.008
	Assume that the equation is not equal.			-2.901	17.972	0.010

Table 10 Independent sample inspection results.

		t test of mean equation			
		Mean difference	Standard error value	95% confidence interval of difference	
				inferior limit	superior limit
US West Freight Rate	Assume that the equation is equal	-77.29833	23.97454	-127.01849	-27.57818

	Assume that the equation is not equal.	-77.29833	23.97454	-129.31286	-25.28381
US East Freight Rate	Assume that the equation is equal	-63.96000	22.05124	-109.69146	-18.22854
	Assume that the equation is not equal.	-63.96000	22.05124	-110.29350	-17.62650

For the Western American freight rate, the Sig. value of the variance equation is less than 0.05, so select the hypothetical data of equal variance, and the Sig. value tested by the mean equation is less than 0.05. Therefore, it can be seen that there is a very significant difference between the freight rate before and after the trade war.It is confirmed that trade has a significant impact on China's price fluctuation to the US.

For the Eastern American freight rate, because the Sig. value of the variance equation is more than 0.05, it is impossible to select the assumption that the variance is equal. The assumption that the variance is not equal is checked. At this time, the Sig. value of the mean equation is 0.01, which is much smaller than the reference value 0.05.Therefore, it can be proved that the trade war has also had a very significant impact on the fluctuation of freight rates in Eastern America.

To sum up, through the independent sample T test,the test results show that there is a very significant fluctuation in the freight rate between China and the United States before and after the trade war.However, the emergence of this fluctuation increases the instability and uncertainty of the route. The abnormal change of the volume on the route promotes the rise of the freight rate in a short period of time, but it consumes the hidden demand in the future ahead of time. From this point of view, its influence can be considered to be negative and disadvantageous, and the consequence is the subsequent weakness of the market demand, which leads to the rapid decline of the freight rate.

6. Conclusion

Through the collation, research and analysis of the data of trade volume, freight capacity and freight rate level before and after the trade war, combined with the dynamic changes of the shipping market, the fluctuation and change of the freight rate level in the trade war are tested.Comparing the changes of the elements of the Sino-US route before and after the trade war, summing up and sorting out the substantive influence of the trade war, and studying the causes and internal relations of these effects are of certain application value to how to effectively avoid and reduce the adverse effects caused by the large-scale trade friction in the future shipping development of our country and even the world.Moreover, this paper focuses on the freight rate on the Chinese and American routes, and uses the significance test to compare and detect the fluctuation of the freight rate, which intuitively reflects the real existence of the fluctuation of the freight rate affected by the trade war. At the same time, in view of the impact of the trade war on the routes between China and the United States, this paper puts forward some suggestions for development:

6.1 Optimize the global layout of shipping and strengthen the risk prevention and control of the global shipping industry.

After the trade war, China has been looking for a new alternative import place to alleviate and avoid the impact. In terms of grain import and export, China should focus on places such as South America and other places to transfer large-scale bulk grain shipments through other transPacific routes.It is enlightened that the major shipping enterprises should strengthen their own construction, improve their own decision-making and emergency plan to manage and deal with the risk, so as to avoid being frustrated when the economic market fluctuates.

6.2 China's Shipping Enterprises should keep up with National Policy and National Strategy.

This year, China is committed to developing national influence and widening the channels of foreign exchanges. As an important strategy at the national level, the 21st Century Maritime Silk Road is committed to strengthening cooperation between China and ASEAN, opening up the road of maritime trade, transportation and exchange to Southeast Asia with the help of the construction of major port areas and ports along the coast of China, and widening the pattern of cooperation between China and the outside world.

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