The Impact of Sino-US Trade Conflict on HS300 Index: An Empirical Evidence

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Abstract. The Sino-US trade conflict provoked by the US in 2018 had a huge impact on China and the global economy through a series of high tariff sanctions. During this period, many fields including the stock market were hit. This study is based on the existing research and analysis of the influence of the Sino-US trade conflict on the stock market and data survey, selects the representative HS300 index, and uses the multiple regression model to study the specific reasons for the influence of the Sino-US trade conflict on it. The study found that the GDP gap and interest rate gap between China and the US have a significant impact on the HS300 index, and the degree of impact is different before and after the trade conflict. The innovation of this paper is that it emphasizes the importance of economic and financial factors when analyzing the impact of trade conflicts on China's stock market through empirical analysis, and this kind of impact is complex and multifaceted. This study provides an important empirical basis for subsequent related research and investors' investment direction.

Keywords: Sino-US trade War, A-Share stock, HS300 index.

1. Introduction

The Sino-US trade war refers to the ongoing trade conflict between the US and China. The trade conflict started in 2018 when the US imposed tariffs on Chinese imports, causing a decline in global trade and affecting various sectors, including the stock market. The trade war has also caused uncertainty and fluctuations in the financial sector, leading to a decrease in stock demand and causing prices to drop. The trade war is ongoing, and its impact on the global economy and the stock market continues to evolve as the situation changes.

A series of high tariff sanctions in Sino-US frictions have had a significant impact on China's export of products as well as its A-share stock market. At the end of 2017, the value of the A-stock market was 56.62 trillion yuan, an increase of 5.75% throughout the year, and the per capita market capitalization increased by 42.9 thousand yuan. However, the A-share market evaporated by 13.24 trillion yuan. Even major indexes and every industry have not been spared. In terms of the performance of the major index, the Shanghai Securities Composite index, the Shenzhen component stock index, the small and medium board index, and the Chinext index all fell by over 20%, which shows that the Sino-US trade war has dealt a huge blow to the A-share stock market.

Existing studies show that the trade conflict has a great negative influence on A-shares through many channels, such as aggravating inflation, reducing consumer spending, and reducing international trade [1]. However, the impact is targeted, especially in industries such as technology and consumer goods [2].

Rising inflation will hurt companies by reducing spending [3]. It can further lead to uncertainty about future trade relations between countries, causing investors to become cautious about investing in the stock market [4]. The mood changes of investors diverge investment away from the stock

market and towards other investments, such as bonds or real estate, which are perceived as safer in times of uncertainty [5].

Based on data from March 2002 to December 2022, this paper uses a multiple regression model to study the extent to which China's stock index has been affected by the trade war. In this paper, two independent variables and one control variable are set. The first variable, "diffUSCNGDP," is the difference between China and the US GDP in logarithm. The second variable, "diffintUSCN," is the difference between the 10-year government bond yield of China and the US. The control variable, "FXUSDCNY," is the currency rate between USD and Nymphic and is set to eliminate the impact of the Sino-US exchange rate fluctuation on the stock market. It is found that the GDP gap and the interest rate difference between China and the US have a significant impact on the HS300 index, and the influence degree is different before and after the trade conflict. The paper's minor contribution is that the empirical analysis stresses both the relevance of economic and financial issues as well as the impact of trade on China's stock market. In addition, this paper indicates that the influence of the Sino-US trade conflict on the stock market might be complex and multifaceted, which provides important empirical basis for subsequent relevant research. The second part of this paper is a review of relevant theoretical and empirical literature. The third part is data, variables, and models. The next part indicates the results of the linear regression analysis. The last part is the research conclusion.

2. Literature Review

The Sino-US trade conflict has been a major topic of discussion among economists and financial experts, with many studies examining the influence of the trade war on the Chinese stock market. The trade conflict started in 2018 when the US imposed tariffs on Chinese imported goods to address issues of intellectual property theft and make up for the huge trade deficit. Since then, the trade war has escalated, contributing to the global economic downturn and affecting various sectors, including the stock market. According to a report by the National Bureau of Statistics, the Shanghai Composite Index, which tracks the performance of all stocks listed on the Shanghai Stock Exchange, dropped by over 20% between June 2018 and December 2019 [2]. Another study by Chengying et al. found that China’s market has been affected by the trade war in complex ways, with some sectors being more affected than others. The authors found that sectors such as technology and consumer goods have been more affected by the trade war, while healthcare and utilities have been less affected [2]. This shows that China’s stock market has been affected by the trade war in particular sectors, not as a whole. At the same time, due to the high degree of external dependence and obvious characteristics of an open economy, the return rate and market value of listed firms in eastern China demonstrated a greater fall in response to the trade conflict's escalation than those of the listed companies in central and western China. [6]. Ye et al found that the Sino-US trade war significantly impacted the Chinese stock market in their earlier study, but other factors, such as the global economy's performance and the domestic economic situation in China, have moderated this impact. The authors found that China’s stock market has been negatively affected by the trade conflict [1]. They also noted that the performance of the global economy and the domestic economic situation in China had moderated this impact [7]. However, the reaction degree and reaction time of China and even the global market to bad news are still far greater than those to good news [8]. Imposing tariffs during the Sino-US trade war will not directly affect the stock market. Instead, it will lead to an increase in the imported goods, which will further aggravate inflation, thus reducing consumer spending and impacting companies’ operations [3]. Furthermore, trade wars can also lead to decreased consumer spending, as consumers face higher prices for imported goods. This can lead to a decline in company sales, causing a decrease in profits and leading to a decline in stock prices [9]. At the same time, reduced international trade is another factor that can result from trade wars, as countries impose tariffs on each other's goods. This can lead to a decline in exports and imports, causing a decline in revenue for companies and leading to a decline in stock prices [4]. In addition, from the perspective of quantitative analysis, Wang Jiangli analyzed the fluctuation of China's stock market during the Sino-US trade conflict with a stochastic

volatility model. The study indicated that the extent of the stock market's fluctuation in China significantly increased during the trade friction, and the risk of the stock market increased, but the persistence of the volatility of the stock market weakened [10].

For investors, the uncertainty of the Sino-US trade war will make them cautious about investing in the stock market [4], and will make their funds shift from the stock market to other safer markets such as bonds or real estate [5], which will reduce the demand for stocks and decrease market liquidity.

According to the analysis and summary of existing studies, the influence of the Sino-US trade conflict on A-shares is targeted and multifaceted, and the imposition of tariffs affects the stock market indirectly. These uncertain factors will affect investors' investment sentiment, and in turn, impact the stock market.

3. Model and Analysis

The data were collected from the Wind database, starting from March 2002 to December 2022. The GDP data are quarterly, and to maintain consistency, all other variables were also calibrated quarterly. This paper aims to analyze the impact of three independent variables (diffUSCNGDP, diffintUSCN, and FXUSDCNY) on the performance of the HS300 index, which is the benchmark index of the China Securities Index Company measuring the performance of the 300 largest and most liquid companies listed on the Shanghai and Shenzhen stock exchanges. The dependent variable is the HS300 index. 'diffUSCNGDP' represents the difference between China and US GDP in logarithm, 'diffintUSCN' represents the difference between 10-year government bond yields of China and the US, and 'FXUSDCNY' represents the currency exchange rate between USD and CNY.

Table 1. Summary Statistics

Variable name	Obs	Mean	Std. Dev.	Min	Max
lnHS300	84	7.861	.51	6.778	8.627
diffUSCNGDP	84	925	.59	.197	2.114
diffintUSCN	84	-.476	1.142	-2.37	2.525
FXUSDCNY	84	7.022	.744	6.118	8.277

The number of observations (Obs) in the analysis is shown in the first row of the table. The mean value of the logarithm HS300 index is 7.86. The standard deviation of the HS300 index is 0.51, which indicates that the performance of the logarithm HS300 index is not widely varied and fluctuated within a small range. The mean value of the diffUSCNGDP variable is 0.925, which suggests that, on average, the difference between the US and China's GDP growth rate is 0.925 units over the 84 observations. The standard deviation of the diffUSCNGDP variable is 0.59, which indicates that the difference between the two countries' GDP is widely dispersed. The mean value of the diffintUSCN variable is -0.47, which suggests that, on average, the interest rate in the United States is 0.4756521 percentage points higher than in China over the 84 observations. The standard deviation of the diffintUSCN variable is 1.14, which indicates that the difference between the two countries' interest rates is widely dispersed. The mean value of the FXUSDCNY variable is 7.022, which suggests that, on average, one USD could exchange for 7.022 CNY over the 84 observations. The standard deviation of FXUSDCNY is 0.744, which indicates that the exchange rate between the two currencies is also widely dispersed.

Table 2. correlation coefficient matrix

Variable name	(1)	(2)	(3)	(4)
(1) lnHS300	1.000			
(2) diffUSCNGDP	-0.814	1.000		
(3) diffintUSCN	-0.553	0.774	1.000	
(4) FXUSDCNY	-0.720	0.899	0.768	1.000

Table 2 is a matrix of cells, with each cell representing the Pearson correlation coefficient between two variables. This coefficient measures the degree and direction of a linear relationship between the variables. The coefficient ranges from -1 to 1, where -1 represents a fully negative correlation, 1 represents a fully positive correlation, and 0 represents no correlation.

For instance, the cell in the first row and second column shows the correlation between the lnHS300 and diffUSCNGDP variables, which is -0.814. This indicates that the two variables have a strong negative association, implying that as the performance of the HS300 index increases, the difference between the US and China's GDP growth rate decreases.

The cell in the first row and third column shows the correlation between the HS300 and diffintUSCN variables, which is -0.553. This indicates a weak inverse relationship between the two variables, implying that as the performance of the HS300 index increases, the difference between the US and China's interest rates decreases slightly. The cell in the first row and fourth column shows the correlation between the HS300 and FXUSDCNY variables, which is -0.720. This indicates a significant negative association between the two variables, implying that as the performance of the HS300 index increases, the exchange rate between the US and China is more likely to decrease.

The correlation matrix summarizes the linear relationships between the variables, allowing for the possibility of conducting a multivariate linear regression model.

4. Linear Regression

Since the start of the Sino-US trade conflict in March 2018, there have been concerns about its potential impact on the Chinese stock market. While it is widely understood that GDP and interest rates can influence the stock index, it is unclear whether there is empirical evidence of this effect. To investigate this, we conducted a segmented regression model to determine whether these variables had different impacts on the stock index before and after the trade war. Additionally, we controlled for the effect of FX on the stock index.

Table 3. Linear regression based on the data before March 2018

lnHS300	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
diffUSCNGDP	-.714	.258	-2.77	.008	-1.23	-.198	***
diffintUSCN	.163	.063	2.58	.012	.037	.289	**
FXUSDCNY	-.155	.173	-0.90	.373	-.502	.191	
Constant	9.658	1.002	9.64	0	7.653	11.662	***

varR-squared Mean	0.605	Bayesian crit. (BIC)	47.906
dependent var	7.715	Prob > F	0.000
Akaike crit. (AIC)	39.271	Number of obs	64
F-test	30.602	SD dependent var	0.495

Note: *** p<.01, ** p<.05, * p<.1

According to the results in Table 3 and Table 4, the first independent variable, "diffUSCNGDP," represents the difference between the gross domestic product (GDP) of the United States and China. The coefficients of this variable, -0.714 and -0.762, suggest that a one-unit increase in the difference between the US and China's GDP is associated with a decrease of these units in the HS300 index. Both models' results are statistically significant at the 1% and 5% significance levels. Additionally, it is apparent that the coefficients are not the same.

The second independent variable, "diffintUSCN," represents the interest rate differences between the US and China. The coefficients of this variable, .163 and -.067, suggest that a one percentage point increase in the difference between US and China's interest rates is associated with an increase of .163 units in the HS300 index before the trade war and a decrease of .067 units after the trade war. Both of the results are significant at the 5% significance level, proving that the trade conflict effectively affected the influence of interest rates on the stock index.

The third independent variable, "FXUSDCNY," is the control variable to minimize the factors that may influence the stock index. The constant term, "_cons," represents the average performance of the HS300 index in the absence of any independent variables. The coefficient of this variable, 9.527, represents the average value of the HS300 index when the independent variables are equal to zero.

In summary, this regression result suggests that the HS300 index's performance is significantly impacted by the difference in GDP between China and the US and the difference in interest rates between the two countries. Moreover, it shows that the effects are different after the trade war. The quantitative analysis of this regression can be used to gain a deeper understanding of the factors that drive the HS300 index's performance and make informed investment decisions.

Table 4. Linear regression based on the data after March 2018

lnHS300	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
diffUSCNGDP	-.762	.336	-2.27	.039	-1.479	-.045	**
diffintUSCN	-.067	.029	-2.35	.033	-.128	-.006	**
FXUSDCNY	-.148	.11	-1.35	.198	-.383	.086	
Constant	9.527	.705	13.52	0	8.025	11.029	***

Akaike crit. (AIC)	-27.121	Bayesian crit. (BIC)	-23.343
F-test	7.180	Prob > F	0.003
R-squared	0.589	Number of obs	19
Mean dependent var	8.330	SD dependent var	0.154

Note: *** p<.01, ** p<.05, * p<.1

5. Conclusion

During the Sino-US trade conflict, the all-round game between the US and China, mainly in the form of imposing tariffs, undoubtedly caused huge fluctuations in the Chinese stock market. The trade conflict affected the A-share market mainly by increasing the uncertainty of trade policies and the cost of trade. This paper aims to use empirical research to determine how the Sino-US trade crisis has affected stock indices. To measure the differences quantitatively, this research employs the method of segmented regression. According to the results of the empirical analysis, the GDP gap and interest rate difference between China and the US have a significant impact on the HS300 index, and the impact is different before and after the trade war. Moreover, the results also emphasize that before the trade war, the interest rate difference had a positive impact on the HS300 index, but after the trade war, it had a negative impact. This indicates that before the trade war, the high interest rate difference between China and the US was related to the rise of the HS300 index. After the trade war, it was related to the decline of the HS300 index.

The empirical results show that the economic factors and financial factors generated by the GDP gap between China and the US and the interest rate differences have an impact on the trade war and A-share stock. In addition, the results indicate that the influence of these factors on the HS300 index varies over time.

In summary, the GDP gap and the interest rate difference between China and the US had significant and different influences on the HS300 index. The results highlight that Sino-US trade friction is transmitted to A-share stock simultaneously through the influence of economic factors such as trade scale and financial markets such as expected return on investment. The trade war's impact on the stock market is multifaceted and complex, as this paper also demonstrates. To fully comprehend the relationship between the trade war and changes in A-share stock, it is necessary to investigate further the potential effects of the Sino-US trade war on A-share stock through other factors.

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