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Analysis Report on the Impact of the US-China Trade War on the A-share Market

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Abstract: This article documents the impact of the US-China trade war on the stock market. Both of the world's economic giants have been significantly impacted by the trade war, which started in March 2018. To the detriment of China's domestic economy and the stock market, it directly affects the profitability of domestic businesses linked to the import and export chain. This paper empirically examines the impact of the US-China trade war on the Chinese stock market by selecting two representative firms on a time-series basis and implementing market phenomena into data analysis for summative and inductive research.

Keywords: US-China trade war, CAPM model, linear regression

1. Introduction

Since 2001, when China joined the World Trade Organization, it has grown to be a significant force in the growth of the global economy. Unlike earlier strategies, the rapid expansion of Chinese Outward Direct Investment (ODI) has been attracting attention from all around the world due to its overwhelming presence and distinctive characteristics [1].

But there must be conflict in trade. Donald Trump, the president of the United States, announced an increase in tariffs on March 22, 2018, affecting Chinese imports worth $50 billion. Tensions increased after the US imposed a 25% tax on Chinese imports worth US$34 billion on July 6, 2018 [2]. The US-China trade war has exacerbated the volatility of the global economy. The tariffs the US has imposed on Chinese goods have directly affected China's export chain, putting more downward pressure on its international trade. Also, these tariffs have hindered the performance of listed companies, raised the vulnerability of trading volume changes, and elevated stock market risks [3]. The renminbi underwent a significant devaluation as a result of trade friction. At the G20 summit that year, the two nations decided against adding new levies [2]. The new crown pneumonia epidemic resulted in a global fall in economic activity in late 2019 and early 2020. The trade-in China's pandemic prevention measures might impact domestic financial markets. Several other issues are now impacting the A-share market, and it is impossible to predict how the US-China trade war will affect the stock market. As a result, it is simple to examine the market from early 2022 to the present, when the Chinese epidemic has subsided, and both the domestic and global economies have recovered.

Trade conflicts between the US and China mainly occur in two areas: 1) those in which China has a comparative export advantage; and 2) those in which China lacks a comparative advantage in terms of imports and technological know-how. To do an empirical analysis, this article will choose

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stocks from well-known businesses in several industries, such as TCL Technological Group Corporation and Henan Xinye Textile Co., Ltd.

2. Capital Asset Pricing Model

The Markowitz model is the foundation for the CAPM (capital asset pricing model). The CAPM describes how a specific investment's risk and expected or future return relate to one another [4]. The compensation received for a unit increase in risk is the same when capital markets approach equilibrium because the marginal price of risk is constant. The marginal effect of any investment that modifies the market portfolio is the same. The capital asset pricing model is produced when equilibrium capital market circumstances, as specified by, are substituted.

$$E(r_i) = r_f + \beta_{im}(E(r_m) - r_f)$$

The market risk premium, which is the anticipated return to the investor as a result of taking on the non-diversifiable risk associated with the equity market, is E(rm) - rf if the expected return on the equity market is E(rm), and the risk-free rate is rf. Consider an asset (such a stock in a corporation) with an expected return of Ri and a risk premium of E(ri) - rf because the risk-free rate in the market is Rf. The capital asset pricing model describes the relationship between the asset's risk premium and the market's risk premium. The formula E(ri) - rf = im (E(rm) - rf) uses an asset beta constant as the coefficient. The beta coefficient offers a measure of how sensitive the asset's return is to changes in the market. The beta coefficient measures the asset's non-diversifiable risk and shows how sharp the asset's return is to market fluctuations. With the help of beta, we can calculate the appropriate discount rate for an asset's present value, which represents the expected rate of return for either that asset or another asset with the same level of risk.

3. Research

3.1. Data Sources

I have collected data on 2 stocks from 2016 to date for this study. Tcl Technology Group Corporation and Henan Xinye Textile Co.,Ltd. are the three stocks I have chosen. According to WIND, the stock sectors of these companies are the textile and electronic components sectors. I converted the daily data to monthly data to reduce non-Gaussian effects. We have used monthly data by methodically using the figure from each month's last day. After confirming the improvement in the historical data's Gaussian qualities through coarse-graining, the monthly data was chosen for the subsequent calculations.

3.2. Data Analysis (Take Henan Xinye Textile Co.,Ltd. for Example)

Table 1: From 2016 to the start of the US-China trade war.

Date	pre_close	close	Ri	rf/100	mkt-rf/100	Ri-Rf
2016-01-29	8.5100	6.0000	-0.294947121	0.0001	-0.0903	-0.295047121
2016-02-29	6.0000	5.7000	-0.05	0.0002	0.0076	-0.0502
2016-03-31	5.7000	6.8900	0.20877193	0.0002	0.1065	0.20857193
2016-04-29	6.8900	7.6800	0.114658926	0.0001	0.0144	0.114558926
2016-05-31	7.6800	7.2000	-0.0625	0.0001	-0.0179	-0.0626

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Table 1:(continued).

2016-06-30	7.2000	7.8900	0.095833333	0.0002	0.0044	0.095633333
2016-07-29	7.8900	7.7400	-0.019011407	0.0002	0.0587	-0.019211407
2016-08-31	7.7400	9.2900	0.200258398	0.0002	-0.0045	0.200058398
2016-09-30	9.2900	6.3500	-0.316469322	0.0002	0.0268	-0.316669322
2016-10-31	6.3500	6.8700	0.081889764	0.0002	-0.0145	0.081689764
2016-11-30	6.8700	7.0200	0.021834061	0.0001	-0.0029	0.021734061
2016-12-30	7.0200	7.0000	-0.002849003	0.0003	-0.019	-0.003149003
2017-01-26	7.0000	6.8600	-0.02	0.0004	0.059	-0.0204
2017-02-28	6.8600	7.1400	0.040816327	0.0004	0.0223	0.040416327
2017-03-31	7.1400	6.6700	-0.065826331	0.0003	0.0282	-0.066126331
2017-04-28	6.6700	6.3100	-0.053973013	0.0005	0.0027	-0.054473013
2017-05-31	6.3100	5.6900	-0.098256735	0.0006	-0.0021	-0.098856735
2017-06-30	5.6900	5.6500	-0.007029877	0.0006	0.0191	-0.007629877
2017-07-31	5.6500	6.0600	0.072566372	0.0007	0.0321	0.071866372
2017-08-31	6.0600	6.1300	0.011551155	0.0009	0.0059	0.010651155
2017-09-29	6.1300	6.0100	-0.019575856	0.0009	-0.0021	-0.020475856
2017-10-31	6.0100	5.9800	-0.004991681	0.0009	0.0152	-0.005891681
2017-11-30	5.9800	6.2800	0.050167224	0.0008	0.01	0.049367224
2017-12-29	6.2800	5.8200	-0.073248408	0.0009	0.0303	-0.074148408
2018-01-31	5.8200	5.5300	-0.049828179	0.0011	0.0412	-0.050928179
2018-02-28	5.5300	5.4400	-0.016274864	0.0011	-0.0315	-0.017374864
2018-03-28	5.4400	5.0500	-0.071691176	0.0012	-0.0336	-0.072891176

Table 2: From the start of the trade war between the US and China until the trade friction eased.

Date	pre_close	close	Ri	rf/100	mkt-rf/100	Ri-Rf
2018-03-30	5.4400	5.0500	-0.071691176	0.0012	-0.0336	-0.072891176
2018-04-27	5.0500	4.8000	-0.04950495	0.0112	0.0183	-0.06070495
2018-05-31	4.8000	5.3800	0.120833333	0.0212	0.0026	0.099633333
2018-06-29	5.3800	4.4900	-0.165427509	0.0312	-0.03	-0.196627509
2018-07-31	4.4900	3.9100	-0.129175947	0.0412	0.0117	-0.170375947
2018-08-31	3.9100	3.8500	-0.015345269	0.0512	-0.0243	-0.066545269
2018-09-28	3.8500	3.8400	-0.002597403	0.0612	-0.0082	-0.063797403
2018-10-31	3.8400	3.6500	-0.049479167	0.0712	-0.094	-0.120679167
2018-11-30	3.6500	3.6800	0.008219178	0.0812	0.0336	-0.072980822
2018-12-28	3.6800	3.5300	-0.04076087	0.0912	-0.026	-0.13196087
2019-01-31	3.5300	3.5700	0.011331445	0.1012	0.064	-0.089868555
2019-02-28	3.5700	4.1800	0.170868347	0.1112	0.0334	0.059668347
2019-03-29	4.1800	4.5100	0.078947368	0.1212	0.0075	-0.042252632
2019-04-01	4.5100	4.3300	-0.039911308	0.1312	0.0161	-0.171111308

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Table 3: From the easing of trade frictions to the outbreak of COVID-19.

Date	pre_close	close	ri	rf/100	mkt-rf/100	ri-rf
2019-04-30	4.5100	4.3300	-0.039911308	0.1312	0.0161	-0.171111308
2019-05-31	4.3300	4.0200	-0.071593533	0.0021	-0.043	-0.073693533
2019-06-28	4.0200	3.8800	-0.034825871	0.0018	0.0507	-0.036625871
2019-07-31	3.8800	3.7800	-0.025773196	0.0019	-0.0144	-0.027673196
2019-08-30	3.7800	3.5000	-0.074074074	0.0016	-0.0627	-0.075674074
2019-09-30	3.5000	3.3800	-0.034285714	0.0018	0.0116	-0.036085714
2019-10-31	3.3800	3.8200	0.130177515	0.0015	0.0281	0.128677515
2019-11-29	3.8200	3.4200	-0.104712042	0.0012	-0.0019	-0.105912042
2019-12-31	3.4200	3.5700	0.043859649	0.0014	0.0299	0.042459649
2020-01-23	3.5700	3.4600	-0.030812325	0.0013	-0.0287	-0.032112325

Table 4: For the period since the epidemic eased and the economy recovered until now.

Date	pre_close	close	Ri	rf/100	Mkt-rf/100	Ri-Rf
2022-01-28	3.6000	3.4100	-0.052777778	0	-0.0497	-0.052777778
2022-02-28	3.4100	3.5100	0.029325513	0	0.0163	0.029325513
2022-03-31	3.5100	3.7900	0.07977208	0	0.051	0.07977208
2022-04-29	3.7900	3.2200	-0.150395778	0	-0.0517	-0.150395778
2022-05-31	3.2200	3.2900	0.02173913	0.0003	-0.0052	0.02143913
2022-06-30	3.2900	3.3200	0.009118541	0.0006	-0.0743	0.008518541
2022-07-29	3.3200	3.2600	-0.018072289	0.0008	0.0308	-0.018872289
2022-08-31	3.2600	3.2300	-0.009202454	0.0019	-0.0107	-0.011102454
2022-09-30	3.2300	3.0000	-0.07120743	0.0019	-0.105	-0.07310743
2022-10-31	3.0000	2.8600	-0.046666667	0.0023	-0.0125	-0.048966667
2022-11-30	2.8600	3.4600	0.20979021	0.0029	0.1418	0.20689021
2022-12-30	3.4600	3.1500	-0.089595376	0.0033	0.0079	-0.092895376
2023-01-31	3.1500	3.1800	0.00952381	0.0035	0.0709	0.00602381

3.3. Linear Regression Analysis

The CAPM model is known to be formulated as $E(r_i)=r_f+\beta_{im}(E(r_m)-r_f)$, to make the linear regression analysis more convenient, I have deformed the CAPM formula.

Deformation of CAPM model formula:

$$Ri - rf = \alpha i + \beta i(Rmkt - rf)$$

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3.3.1. Henan Xinye Textile Co.,Ltd

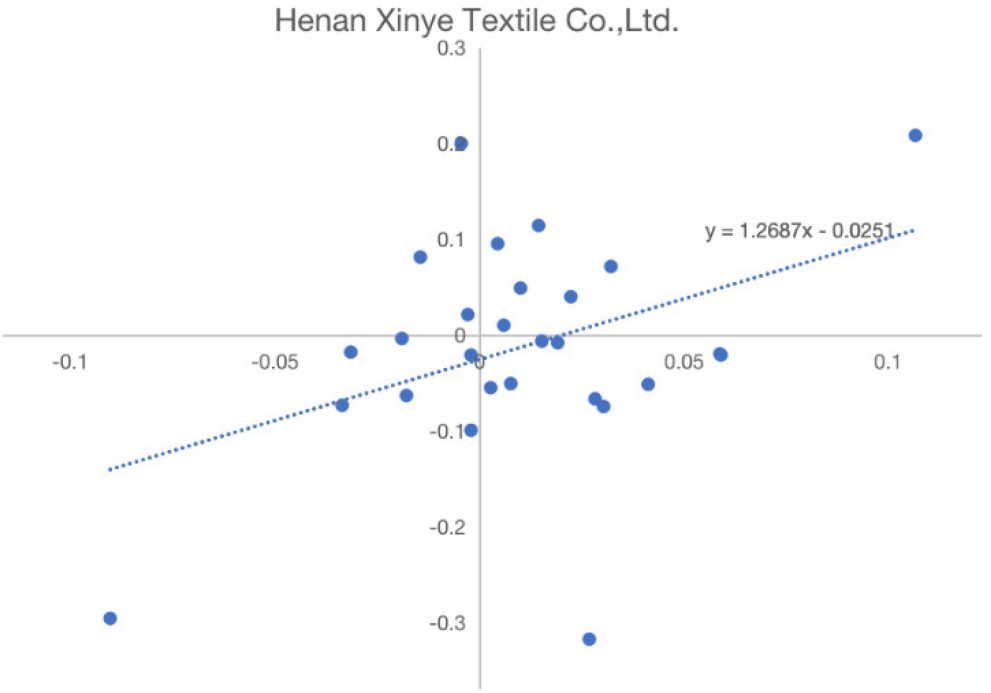

Figure 1: January 29, 2016 – March 28, 2018.

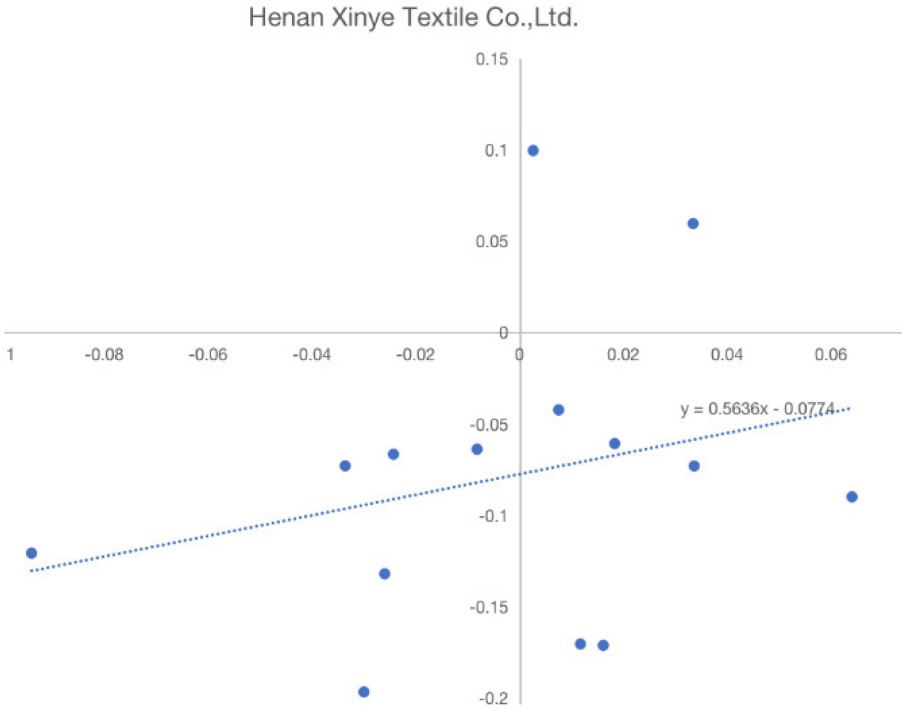

Figure 2: March 30, 2018 – April 1, 2019.

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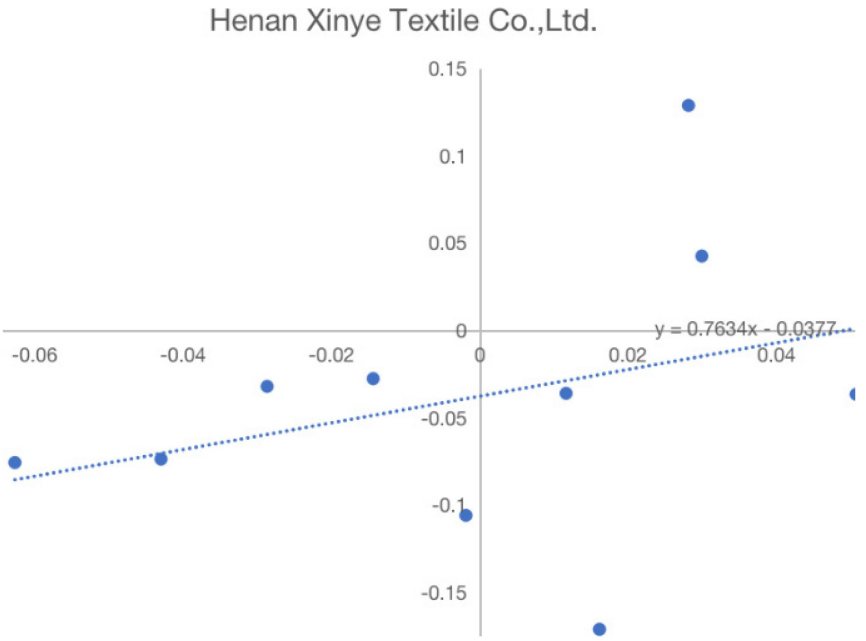

Figure 3: April 30, 2019 – January 23, 2020.

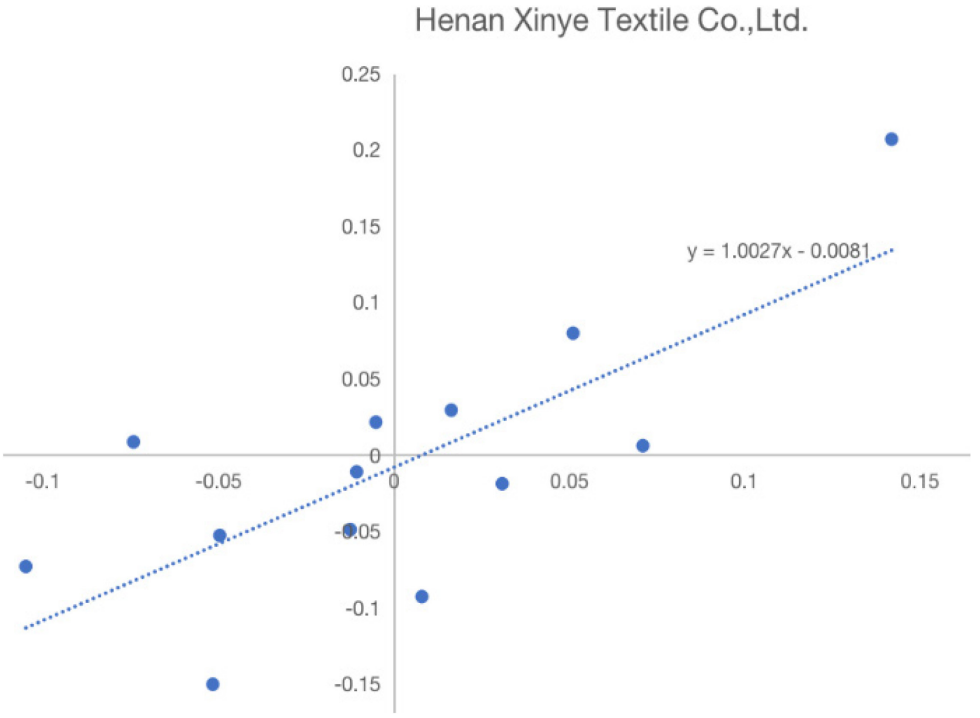

Figure 4: January 28, 2022 – January 31, 2023.

As can be seen from the Figure 1-4 above, α1=-0.0251, α2=-0.0774, α3=-0.0377, α4=-0.0081.

Comparing the size of the data:

$$\alpha 4 > \alpha 1 > \alpha 3 > \alpha 2$$

It's interesting to note that China is one of the top markets for American agricultural exports and that America is China's third-largest source of farming imports [5]. China has tariffs on practically

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all-American agricultural products, including soybeans, corn, cotton, wheat, Canadian coffee, EU grains, and Turkish rice [6,7]. Because of the US-China trade war, agricultural products have been affected in China and the US. Cotton is one of them, and it is the raw material for the production of most textiles, which ultimately affects the textile industry according to the passing of the production chain.

According to a comparison of values, minor deals were found in the early stages of the trade war between the US and China. The first period had few measures for companies to respond and was characterized by severe trade frictions, which had a significant impact on stock returns; the later period saw trade frictions ease, and companies had corresponding remedial measures in place at this time; the last period saw the impact of the epidemic and trade frictions slow down as countries no longer focused on increasing tariffs or suppressing companies in other countries. Especially after the liberalization of domestic anti-epidemic measures in China, the domestic economy recovered, and the situation for equities was favorable.

3.3.2. Tcl Technology Group Corporation

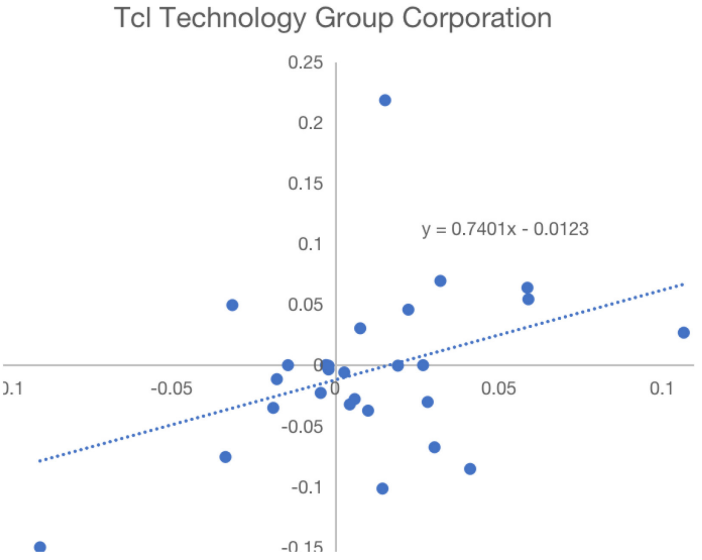

Figure 5: January 29, 2016 – March 28, 2018.

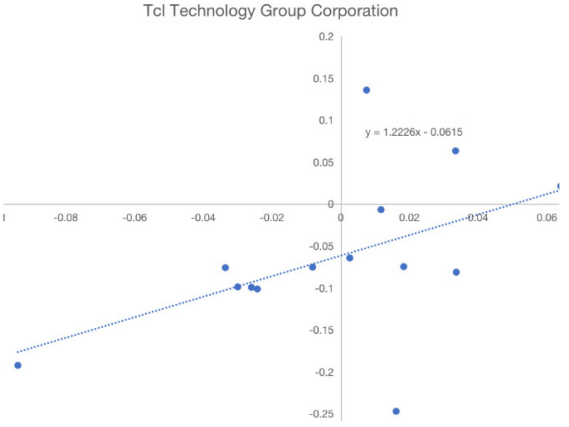

Figure 6: March 30, 2018 – April 1, 2019.

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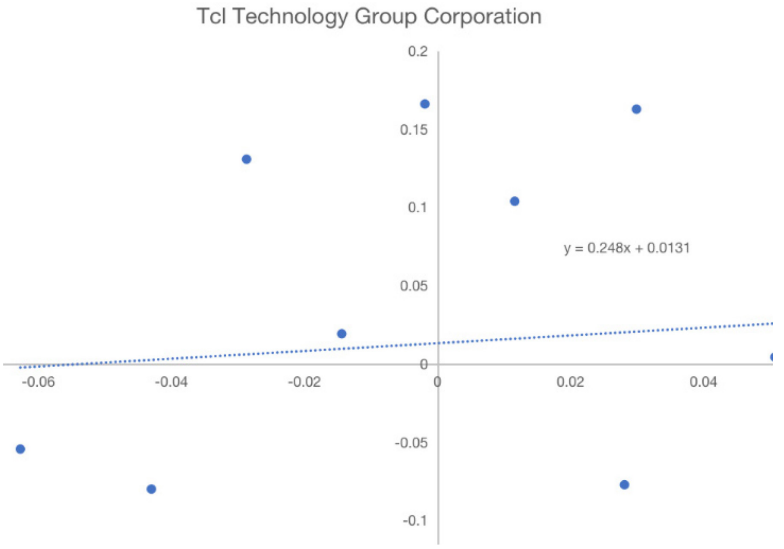

Figure 7: April 30, 2019 – January 23, 2020.

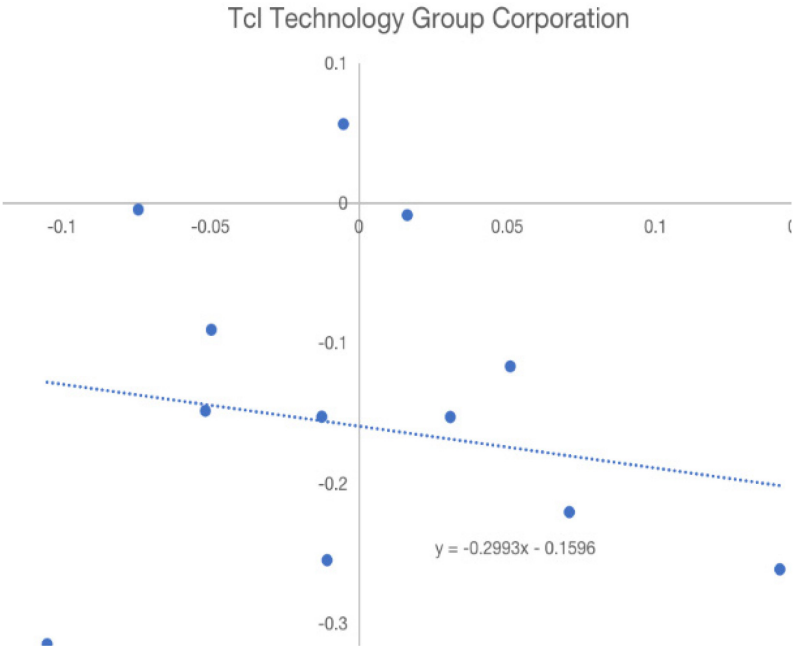

Figure 8: January 28,2022 – January 31, 2023.

As can be seen from Figure 5-8 above, α5=-0.0123, α6=-0.0615, α7=0.0131, α8=-0.1596

Comparing the size of the data:

$$\alpha 7 > \alpha 5 > \alpha 6 > \alpha 8$$

In modern times, electronic components are also part of the high-tech industry. China's exports in the US-China trade have increasingly evolved into an export structure dominated by the proportion of processing trade and manufacturing exports rather than direct items. The amount of technology in a given age and its goods is likewise progressively increasing. This also clarifies the primary rationale behind the US government's decision to put tariffs on expensive manufacturing. This is

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done to close the trade gap [8]. The trade war was fought to stop the growth of China's trade war and lessen the long-term American disadvantage in US-China trade [9].

Tcl Technology Group Inc. is a company in the local technology sector in China. Because of the previous development of economic globalization, countries' trade was liberalized, and everyone took advantage of each other's strengths. The United States leads the world in technological development and therefore relies heavily on imports of electronic components. After the increase in tariffs, domestic technology companies have become more dependent on local electronic component technology. At the beginning of the trade between the US and China, the manufacturers still had some inventory. Still, after the list was depleted, i.e., during the period of easing trade friction, tcl stock yields reached their highest value. Following the epidemic policy slowdown, countries resumed trade exchanges, and the overall economic situation developed positively, even though trade frictions still existed.

4. Conclusion

This is how the CAPM model is used in the stock market. In this article, to better control the variables and reduce the impact of other factors on the change of stock returns, the time of the covid-19 outbreak is purposely avoided and only two years before the start of the US-China trade war, from the beginning of the trade war to the easing of trade frictions and after the epidemic are selected. Henan Xinye Textile Co.,Ltd. Represents Chinese companies with export advantages. It was mainly negatively affected by the trade war, and its gains decreased as the trade frictions intensified; Tcl Technology Group Corporation represents Chinese companies that do not have export advantages. The trade war has a positive impact, with gains increasing in the face of import restrictions on foreign high technology.

While a trade war will have a short-lived positive impact on some businesses, it will mostly have a negative impact. It will disrupt the market and affect equity yields. While trade frictions are inevitable, provoking trade wars in bad faith is also undesirable. Under the impetus of economic globalization, countries should actively engage in cross-border trade to maximize the benefits to each other.

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