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The impact of tariffs policy on the US automobile industry’s performance

In Partial Fulfillment of the Requirements

for the Bachelor of Science in Finance

by

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Abstract

This paper measures the relationship between tariffs rate and the U.S. automobile industry. The hypothesis is that imposing a higher tariff rate will have some negative impact on the U.S. automobile industry. This study uses linear regression to indicate the relationship between tariffs rate and automobile sales. In order to have a better understanding of how tariffs rate influences the automobile companies, several typical companies were selected to do further research. ROE, ROA ratio and Daily Stock Return is used to justify those specific firm's performance. The previous study found the change of tariffs rate has some impact on U.S. imports and decreased sales of China-made U.S. brands. This study hopes that more unintended consequences can be discovered.

Keywords: Tariffs Rate, U.S. Automobile Industry, Firm Performance

Table of Content

Introduction

According to a survey from the American Chamber of Commerce in Shanghai and Beijing-based American Chamber of Commerce in China, U.S. automakers in China are feeling the most pain as some American companies are getting hurt by new tariffs rate. Therefore, this paper aims to figure out the impact of the U.S. tariffs policy on the U.S. automobile industry. This paper hypothesizes the tariffs policy will have some negative effect on U.S. automobile industry.

In May 2018, Chinese government announced that they would impose retaliatory tariffs on U.S. imports, including automobiles. As one of the world's largest market for automobile sales, China's decision will influence the automobile industry of many countries. Especially for those multinational automobile companies that highly rely on Chinese market.

This study wants to focus on whether the tariffs rate will influence the sales of the U.S. automobile industry and the stock performance of several international automobile companies. The automobile industry is closely related to people's life. The analysis of the relationship between tariffs rate and the U.S. automobile industry may help people find some unintended effect of the trade war.

In the previous study, many researchers are interested in whether the tariffs rate will influence U.S. imports. This research prefers to consider the US automobile industry as a whole market, including both international automobile company and domestic automobile company. Therefore, this research is able to explore the impact of trade war on an entire industry.

Hypothesis:

H1: When the tariffs rate increase, the sales of automobiles will decrease accordingly.

H2: When the tariffs rate increase, the multinational firms' stock performance will decrease accordingly.

Literature Review

In 2018, the Chinese government announced that it would impose higher tariffs on specific industries, including the automotive industry. The abrupt increase in tariffs caused the U.S. automakers worried about their companies, especially those managers of multinational companies. A research did by the Center for Automotive Research considered 10 policy scenarios. Their result indicated that in the most serious situation, the price of the average vehicle sold in the U.S. would increase by about "2,750" dollars. At the same time, it would threaten around "366,000" jobs (Schultz, Dziczek, Chen, & Swiecki, 2019). Considering this, research about how the tariff policy impact on the U.S. automotive industry seems very necessary.

Tariffs Policy

Previous research believed that there exist four policies that will directly influence the U.S. automotive industry. The author Schultz, Dziczek, Chen and Swiecki (2019) asserted that four policies are "the United States-Mexico-Canada Agreement (USMCA), Section 232 national security tariffs on imported steel and aluminum, Section 301 tariffs implemented against imports from China, and the potential for Section 232 national security tariffs on imported autos and auto parts." In this study, instead of considering various tariff policies, the data from this research will be directly used to calculate the average tariff rate. America impose tariffs rate on Chinese imports will incur retaliatory tariffs. The aim to reduce the U.S. trade deficit with China would achieve. (Lawrence, 2018) At the same time, in both China and America the GDP will decrease a little bit and the employment will be influenced. (Abdul et al., 2018)

The Impact of Tariffs Policy on Firms

The imposing tariff rate has an almost instant effect on the price in America. This impact is a little bit larger than the simple pass-through regression (Amiti, Redding, & Weinstein, 2019). In other words, if the tariffs increase by 10%, the price of the product will increase by more than 10%, such as 10.5%. In a typical situation, the increase in price will reduce the sales volume of companies. This paper will use this finding as to the theoretical foundation. The rise in tariffs means U.S. companies and customers need new equilibrium, which is related to less efficient and more expensive suppliers (Caceres, Cerdeiro, & Mano, 2019). U.S. multinational companies and Chinese exporter who have made irreversible investments in China would suffer huge costs. Meanwhile, many American companies may be compelled to write off their investments in China (Amiti et al., 2019). In a word, imposing tariffs may increase the costs and decrease the sales volume of companies. Therefore, it is very meaningful to research on the impact of the tariff rate on U.S. multinational auto companies.

The Impact of Tariffs Policy on Automobile Industry

Compared with the industries that were not restricted by tariffs, the price of those industries that were subject to tariffs rate is more fluctuate (Amiti et al., 2019). Thw automotive industry is not an exception. The increase in price is not only occurred in multinational companies but also happened among domestic companies. Due to the decline of competition of imports, those local companies choose to raise their prices (Amiti et al., 2019). The unstable price influenced many U.S. states which have a transactional deal with China (Caceres et al., 2019). Those states suffered a lot due to the change of auto tariffs scenario, especially for those states that specialize in a few particular industries. Some researchers considered the potential influence of tariff friction from a different perspective, and they took advertising, consumer boycotts and consumers' heterogeneous responses into consideration. Their results emphasized the unintended consequences of tariff retaliation, and they suggested the government should be cautious when imposing tariffs (Chu & Chu, 2019).

The Impact of Tariffs Policy on Global Market

China and America are not the only two countries that will be influenced by the tariff policy; other regions will also suffer from it, such as Japan and Europe. (Abdul et al., 2018) The trade friction may cause some severe problems on the global market, mainly when the Chinese government chose to retaliate, it may decrease the world output for several years (Bolt, Maveromatis, & Wijnbergen, 2019). Japan, as the country that mainly trades with both America and China, Japanese multinational companies faced with a serious challenge during the trade friction. The trade war will cause lower the market valuation of the Japanese MNCs (Sun, Tao, Yuan, & Zhang, 2019). Their research used two models to measure the market value of the companies. The two models are called Cumulative Stock Returns (CRR) and Cumulative Abnormal Returns (CAR). In their study, by comparing the two ratios in international Japanese companies that trade with China and America and others that do not trade with China and America, the results reveal the higher tariffs rate has a negative impact on Japanese multinational companies. These two models will not be used in this research. Since this research only test several typical American multination companies' market values. Instead, the average daily return on stock will be used to see whether the tariff policy will decrease the market value of the U.S. automotive companies.

The Impact of Tariffs Policy on U.S. Import and Export

The change in tariffs almost does not affect exporter prices. However, the application of tariffs rate will decline in imports in the automotive sector. The maintenance of U.S. export prices indicates that the full cost of retaliatory tariffs is taken by foreign countries' consumers and importers (Amiti et al., 2019). Although the exporter prices are not be influenced right now, the change of tariffs may affect export from other aspects. The increase of tariffs rate may shift consumer demand from abroad to home, leading to a rise in the exchange rate. As a result, U.S. exports will decrease (Bolt et al., 2019). The effect on U.S. imports and export will eventually make the automaker feel stressful.

To sum up, the previous studies are more interested in the influence of trade friction on multinational companies or U.S. imports and exports. In this study, the entire U.S. automotive industry will be considered. A linear regression model will be constructed to show the relationship between tariffs rate and the sales volume of the whole U.S. automotive industry. Also, several typical American multinational companies will be selected to see whether the companies' stock price, profitability and market valuation will be affected by the tariff policy or not.

Research Design

In this study, correlation research will be used to show the whole picture. A linear regression model will be constructed to show the relationship between tariffs rate and the sales volume of the entire U.S. automobile industry. This linear regression is able to directly reflect whether the tariff rate will influence the U.S. automobile industry. At the same time, holding other factors constant

Based on this, the model will be:

$$Sales\ of\ automobile = b * tariffs\ rate + a$$

Sales of the automobile are the automobiles sales volume in America per month in 2018

Tariffs rate is the tariffs rate the Chinese government impose on America of automobiles in 2018.

a is the constant term, and *b* is the coefficient.

For the firm level, three international automobile companies will be considered as the typical companies to do further analysis. This research is going to use graphs to directly reflect the change of ROE, ROA and market share in China of those companies. Some news related to the cash flow of those companies will be included.

Return on Equity (ROE) and Return on Asset (ROA) are two essential ratios in analyzing a firm's performance. Return on Equity is considered a measure of how effectively management is using a company's assets to create profits. The performance of ROE depends on the performance of the industry or company peers. ROA indicates the earnings generated from assets. Return on Assets for public companies highly relies on the industry. Therefore, this study is going to compare the three companies' ROE and ROA with the industry.

Return on Equity=Net Income/Average Shareholders' Equity

Return on Asset=Net Income/Average Assets

This research will use the daily return model to analyze the performance of the stock. Daily return will be calculated and compared. The change of daily return is able to reflect whether the tariffs rate will influence the stock performance of U.S. international automobile companies.

Based on this, the model is:

$$Daily\ Return = ((Adjusted\ close\ price_{t} - Adjusted\ Close\ Price_{t-1}) / Adjusted\ Close\ Price_{t-1})$$

Average Daily return is average daily return of each company in three mouths.

Adjusted close price$_t$ is adjusted for both dividends and splits at time t.

Results

Tariffs Rate and Sales Volume of Vehicles

The data of tariffs rate were collected from the U.S. Census Bureau, USTR and USITC. The sales volume of the automobile is available on the Federal Reserve Bank. In order to correctly reflect the influence of the tariffs rate, this study uses monthly data from January 2018 to December 2018. By comparing the change of sales volume, the researcher is able to find out whether the change of tariffs rate will influence the sales volume of the U.S. automobile industry.

The result of regression analysis:

R Square	Coefficients	Std Error	P-value
0.074137055	0.648	0.52536238	0.232450432

Table 1-The Result of Regression Analysis

The result shows that the tariff rates do not have a clear linear relationship with the sale of vehicles in the U.S. automobile market. It may be due to multiple reasons. The data from U.S. International Trade Administration indicates that 48% of vehicle sales in American are imported from other countries in 2017. The vehicles imported from Mexico take the largest percentage. For those vehicles produced in America, only 12% of U.S. Motor Vehicle Parts are Import from China in 2017. Hence, the higher tariffs rate only has slight influence on the production of automobiles in America. As a result, the sales volume of vehicles will not be influenced a lot. The first hypothesis was rejected. There is no significant relationship between tariffs rate and sales volume of automobiles in the U.S. automobile industry. While, the U.S. Exports of New Passenger Vehicles and Light Trucks to China declines a lot.

U.S. Exports of Automobile

The yearly data about U.S. exports automobile to china is collected from the Bureau of the Census, and the annual data can directly reflect how the tariffs rate effect U.S. automobile exporters. This research collected data of U.S. exports automobile to China from 2014 to 2018. The trend in five years is able to reflect whether there exists a significant change in 2018.

2014	2015	2016	2017	2018
9,942,175,219	8,264,903,454	8211,990,469	9,526,202,379	6,208,342,450

Table 2-U.S. Exports of New Passenger Vehicles and Light Trucks to China

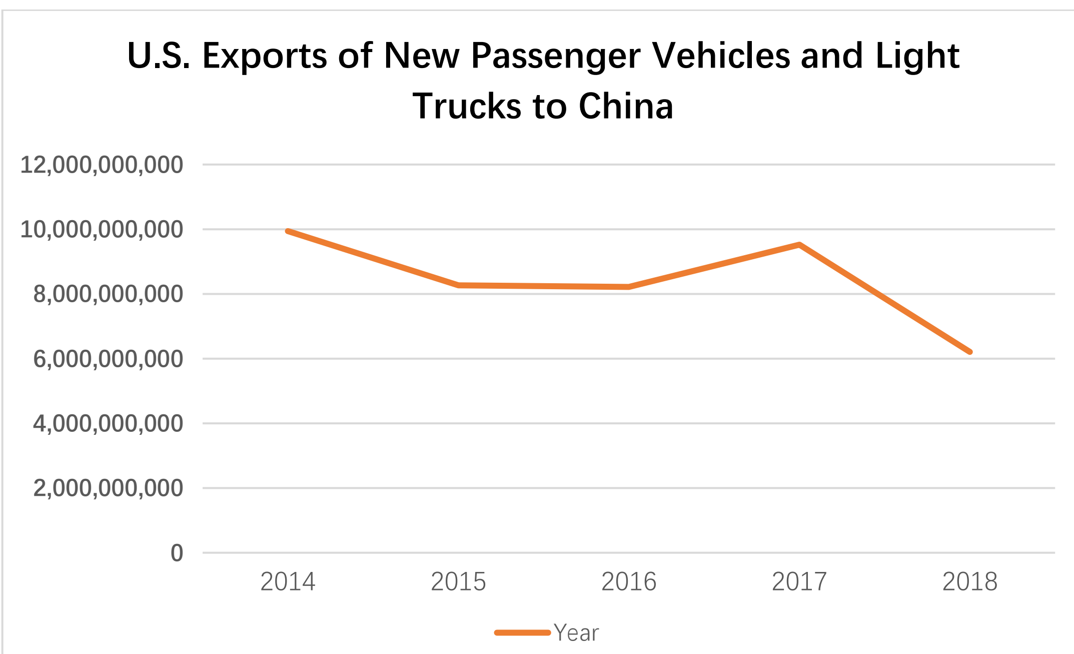

Figure 1-U.S. Exports of New Passenger Vehicles and Light Trucks to China

Figure 1 indicates that in 2018, the exports of vehicles to China decrease a significant amount. In 2017, China was the largest exporter of U.S. automobiles. Therefore, the sharp decrease in exports to China will damage U.S exporters' profits. From this, we can conclude that although the increase of tariffs rate only has little impact on the sales volume of the whole automobile market, those international automobile companies may suffer a lot.

Firms Level

Market Value

The change of market share in China released on companies' annual reports. This research collected data from 2013 to 2018, since the more extended periods are more likely to reflect the impact of tariffs rate. ROE and ROA ratios are obtained from Bloomberg from 2017 Q1 to 2019 Q3, and the historical trend can reflect the influence of tariff more clearly and directly. The historical stock price can be collected from the Yahoo Finance website. In this research, the stock price will be obtained from March 1, 2018, to December 1, 2018. By analyzing the changes in stock price, the researcher can figure out whether the change of tariffs rate will influence the U.S. automobile industry from the firm level.

2013	2014	2015	2016	2017	2018
5.00%	4.60%	4.50%	4.60%	4.20%	2.90%

Table 3-Ford Companies' Automobile Market Share in China

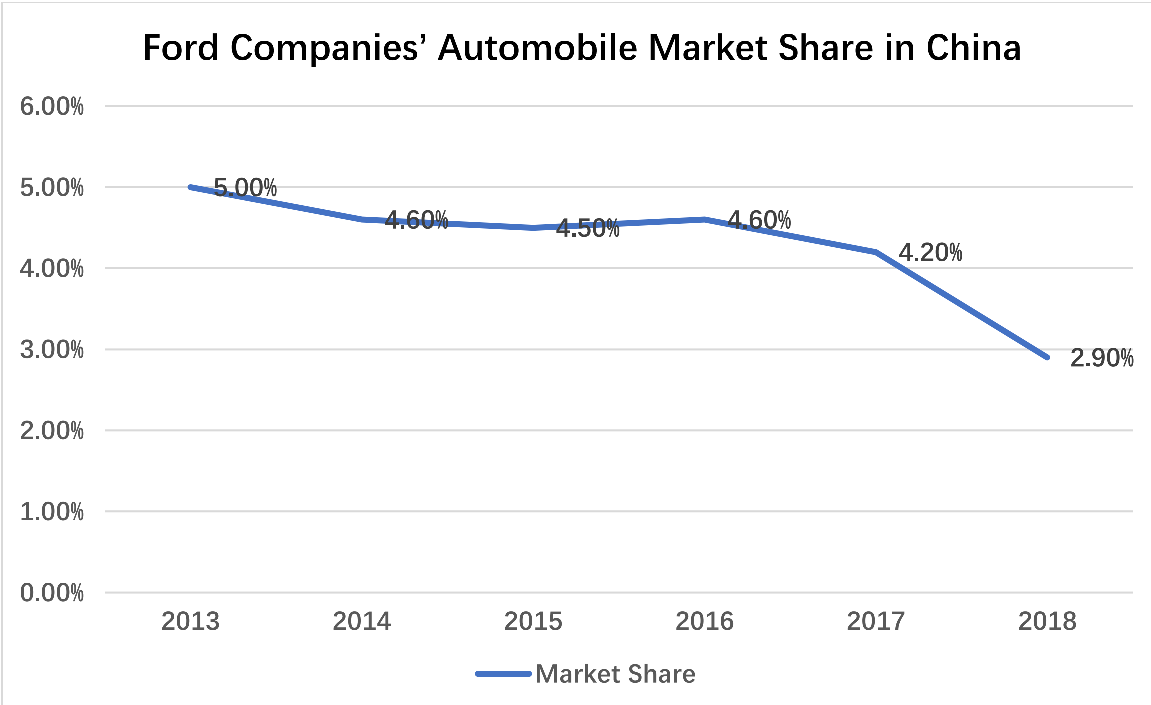

Figure 2- Ford Companies' Automobile Market Share in China

This table indicates that from 2013 to 2017, the Ford Companies' market share in China is very constant, while, in 2018, it decreases by about 1.3%. Although we cannot contribute this decrease to the increase of tariffs rate, the CEO of Ford Companies said they suffered a lot because of the higher tariffs rate. At the same time, the Ford companies state in their financial statements that the sales volume can be violated during the significant pollical event, and as a result, may have a negative impact on their operation condition and operating cash flow. Based on the above information, a brief conclusion can be claimed that the higher tariffs rate plays a role in the decrease in market share. In other words, imposing a higher tariff rate has some negative impact on Ford Company.

2013	2014	2015	2016	2017	2018
14.20%	14.70%	14.90%	13.80%	14.30%	13.80%

Table 4-General Motors Companies' Automobile Market Share in China

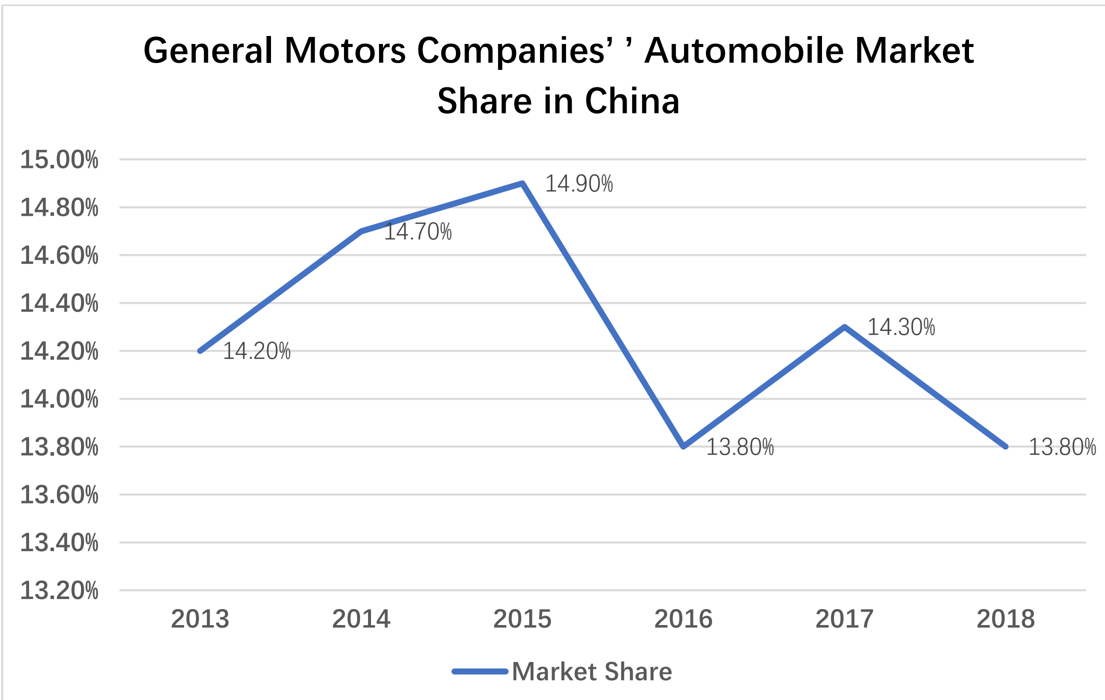

Figure 3-General Motors Companies' Automobile Market Share in China

Although the market share in China of GM only decreases by 0.5%, the industry sales in China drop by 6.3% compared to 2017. In their financial report, they contributed this decrease to pricing pressures, a more challenging regulatory environment related to emissions and a weaker Chinese Yuan against the U.S. Dollar. They also express that they think the Chinese market is crucial to them, therefore the tariffs rate is critical. Thus, the conclusion that a higher tariffs rate will have a negative influence on General Motors Company is correct.

2013	2014	2015	2016	2017	2018
0.80%	1.00%	0.80%	0.80%	0.90%	0.80%

Table 5-Fiat Chrysler Companies' Automobile Market Share in China

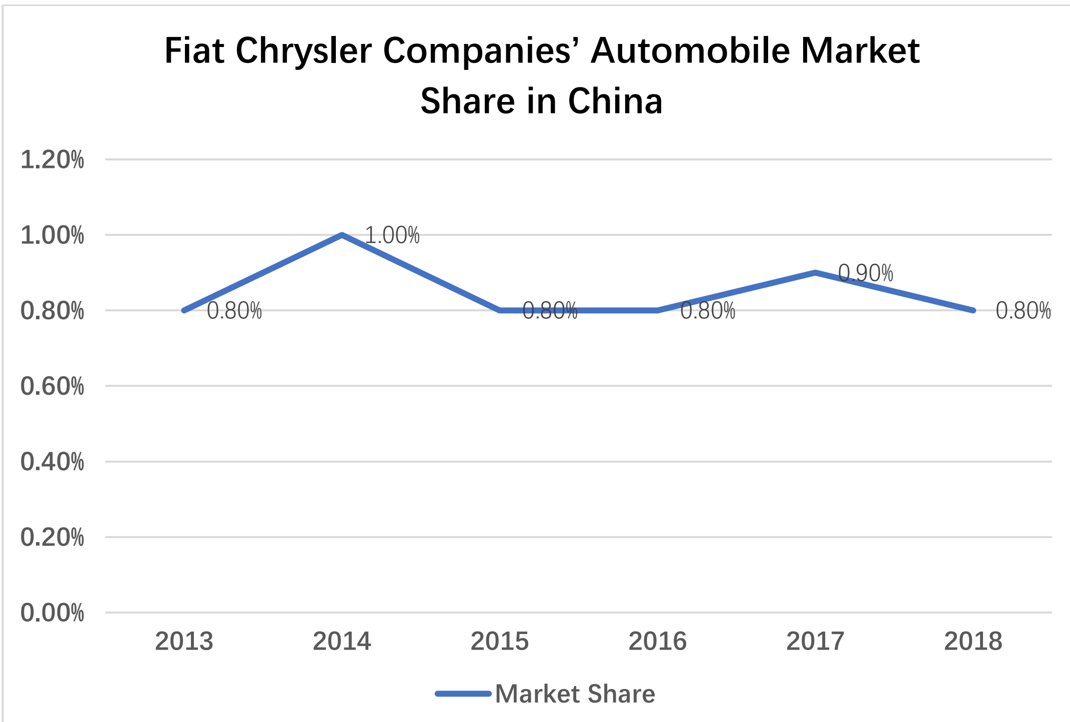

Figure 4-Fiat Chrysler Companies' Automobile Market Share in China

Although the market share in China of FCA does not change a lot, the annual report indicates that the industry demand in China decreases by about 7% from 2017 to 2018. In 2018, the total sales of Maserati vehicles were 35 thousand, a decrease of 28% compared to 2017. It is mainly because of the decline in sales in China. The consolidated shipments in 2018 also slightly decrease compared to 2017, mainly due to the decrease in import volumes, which is caused by the weakness of the Chinese market. Therefore, even though the market share is still stable in Fiat Chrysler Companies, their selling performance in China market is worse than in previous years. We can still conclude that a higher tariff rate will have a negative influence on Fiat Chrysler Company.

Ratio Analysis

Both Return on Assets (ROA) and return on equity (ROE) are measures of how a company utilizes its resources. These two ratios can provide information on whether the higher tariffs rate has an impact on the firms' operation ability.
Return on equity (ROE) that is considered good or bad depends on what is common for peers of a stock.

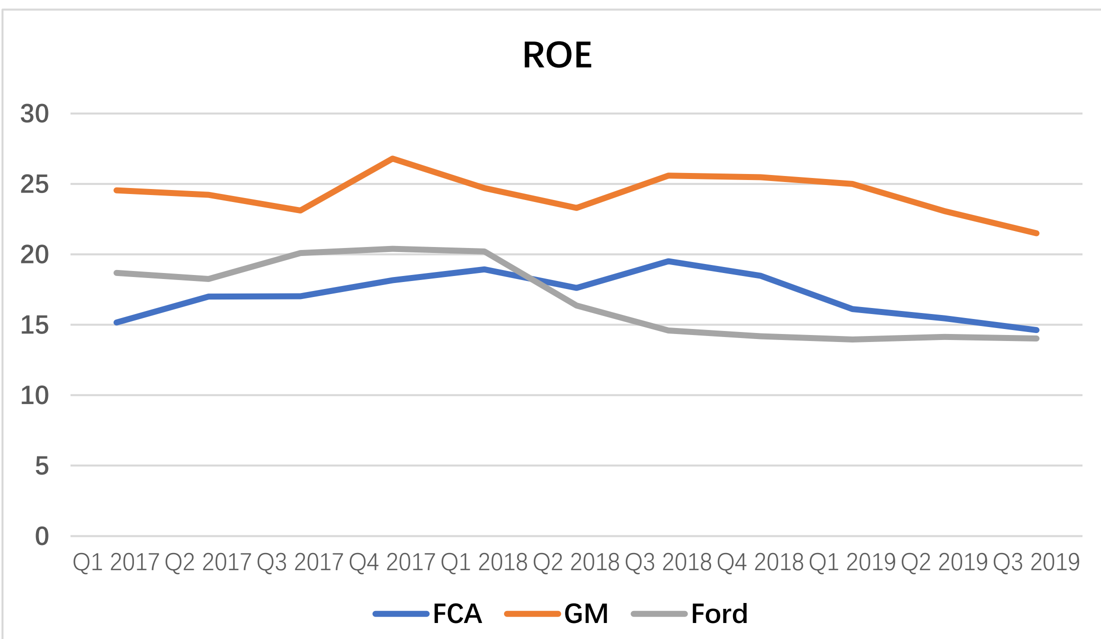

Figure 5- Compare ROE among Three International Companies

Based on figure 5, we can notice that since 2017, the ROE ratios of three companies do not get too much of a bump. Although there is a slight decrease in 2018 Q2 (after the announcement of imposing higher tariffs rate), the overall trend is very steady. Therefore, this research can conclude that imposing a higher tariff rate will not impact on the effectiveness of the companies' management.

Return on Assets can vary substantially for public companies and will be heavily dependent on the industry. Hence, comparing ROA with a similar company or industry can measure the performance of ROA.

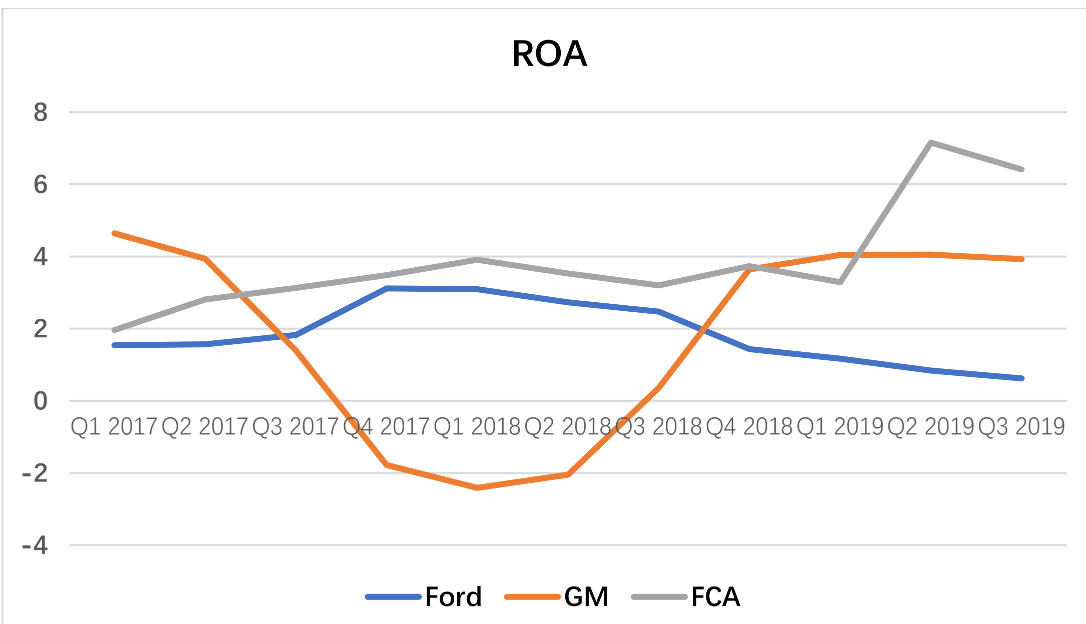

Figure 6- Compare ROA among Three International Companies

Figure 6 suggests that since 2017, the ROE ratios of Ford Company and Fiat Chrysler Company do not get too much of a bump, while General Motor Company's ability to generate earnings from assets fluctuates a lot. For the Ford Company, after the announcement of imposing a higher tariff rate, the ROA ratio slightly decreased compared with the other two companies. Overall, the higher tariffs rate almost has no impact on the effectiveness of the companies' management.

Stock Performance

Events always will influence the stock price, and then will impact the market value of the companies. Hence, the analysis of the stock performance of three international companies is critical.

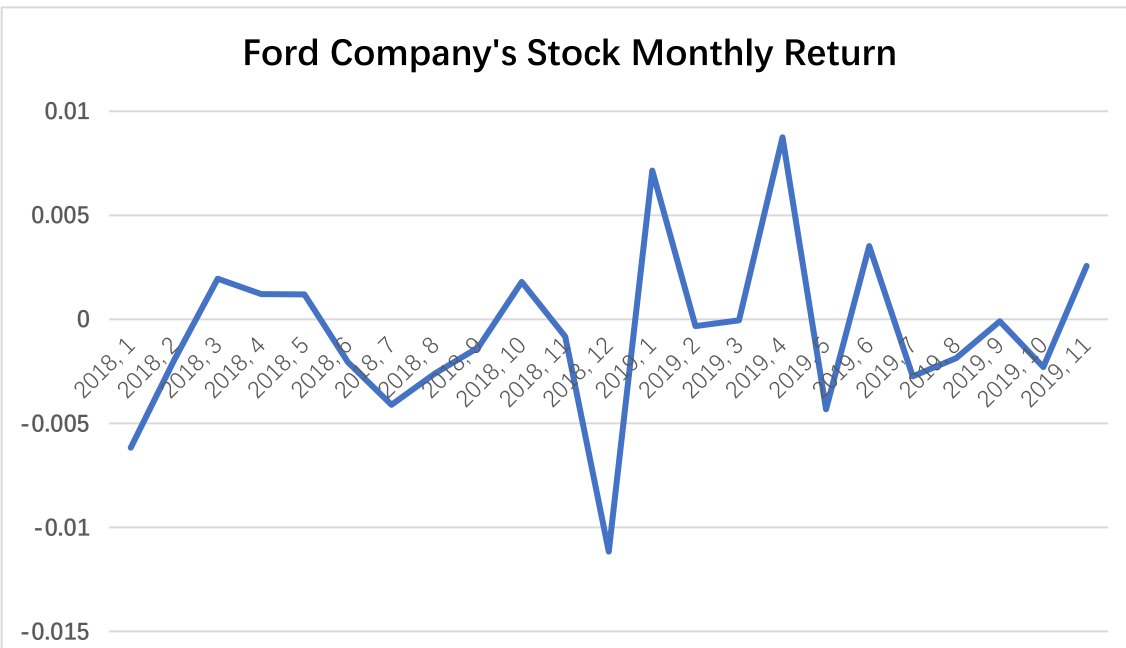

Figure 7- Ford Companies' Monthly Return of Stock

Figure 7 indicates a sharp decline of daily return after the Chinese government's announcement to impose a higher tariff rate (May 2018). We can conclude that the stock performance of Ford Company became worse.

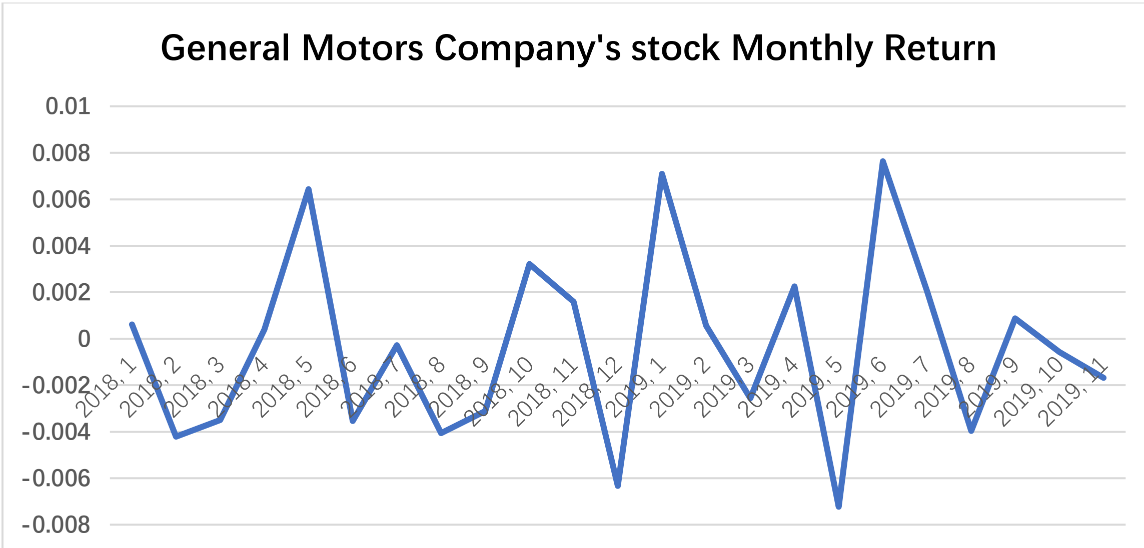

Figure 8- General Motors Companies' Monthly Return of Stock

The worse stock performance of General Motors Company can be concluded based on figure 8, which reveals a sudden decrease of daily return after the Chinese government imposed a higher tariff rate on automobiles (May 2018).

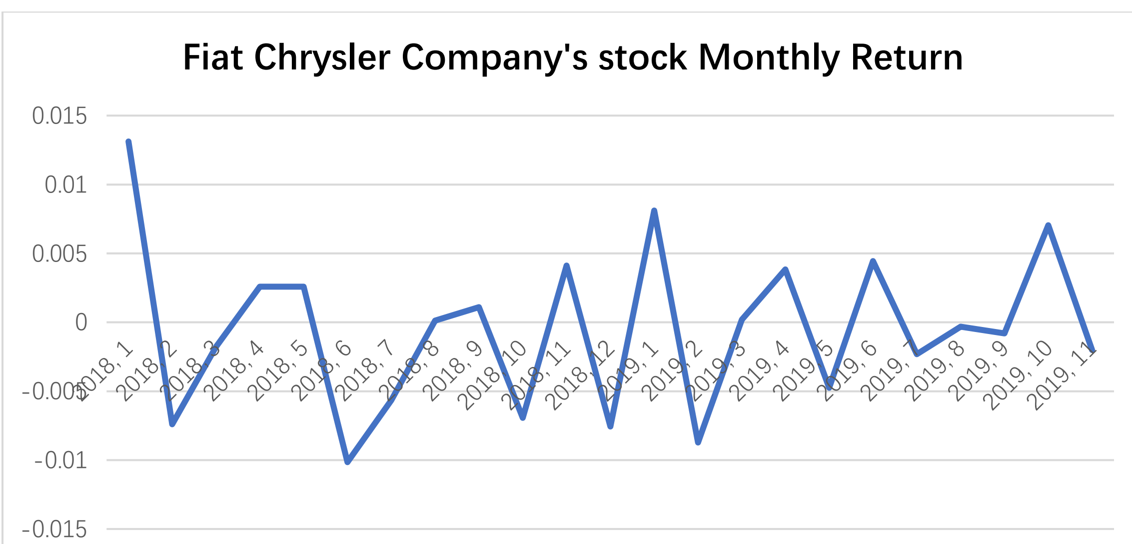

Figure 9- Fiat Chrysler Companies' Monthly Return of Stock

Same thing happens on Fiat Chrysler Company, the stock return decreases after the Chinese government imposed a higher tariff rate on automobiles (May 2018). We compared the monthly stock return and noticed that the trend of three companies are very similar.

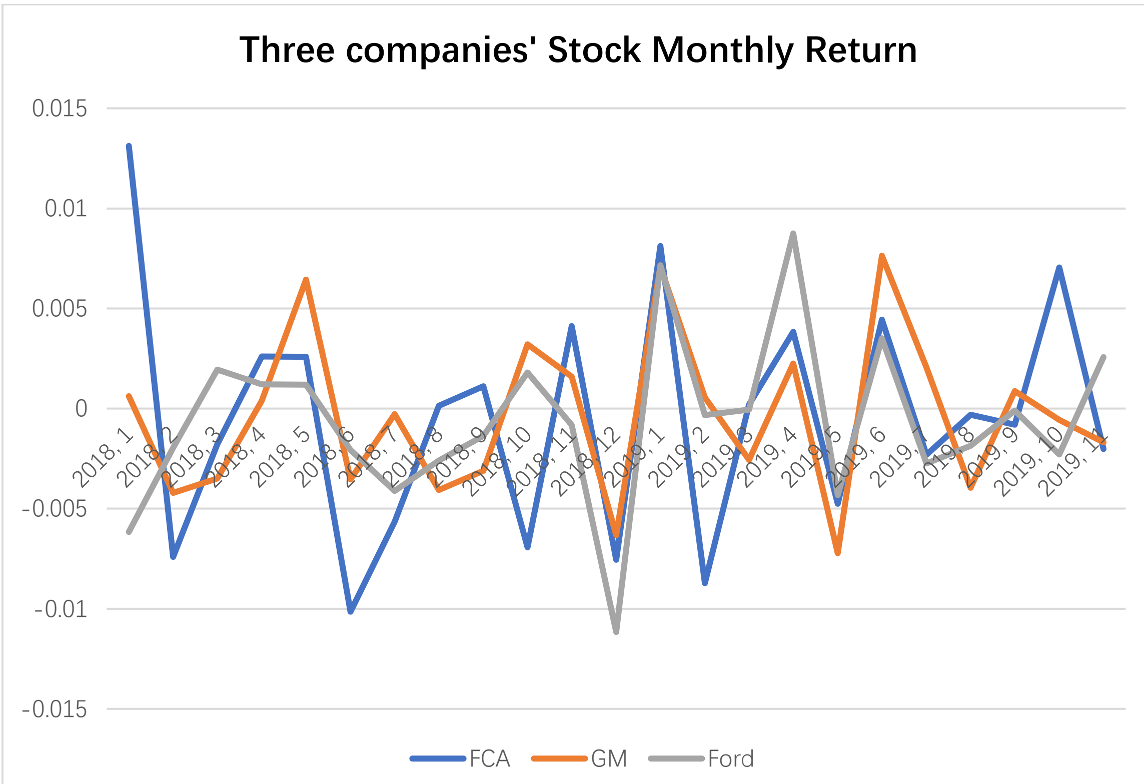

Figure 10- Compare Stock Return Among Three International Companies

From figure 10, a remarkable decrease happens in June 2018, when just after the announcement that higher tariffs rate will be imposed. Then in December 2019, the Chinese government decided to lower tariffs on U.S. automobiles temporarily. So, the stock return of January increases for all three companies. On January 22, 2019, the U.S. cancels preparatory talks with China, and then the stock return decreases. On March 31, 2019, the China extends the suspension of additional tariffs on US autos and auto parts, and then the stock return increases for all three companies. On May 13, 2019, Chinese government announces that it will impose higher tariff rates on American products. Therefore, the stock return decreases for those companies. From all those events and changes in the monthly stock return, we can simply conclude that the trade war will significantly influence the stock performance of the U.S. international automobile companies.

Based on the current results, the second hypothesis that when the tariffs rate increase, the multinational firms' stock performance will decrease accordingly is supported.

Overall, this research can conclude that, although the sales volumes of the U.S. Automobile were not influenced, the international automaker companies are facing a decrease in industry demand in China. The amount of exports automobile decreases a lot compare with previous years. And a reduction of daily return happens accordingly. By analyzing the ROE and ROA ratio, the research found that imposing a higher tariff rate will not influence the management performance of companies. Therefore, based on current findings, the conclusion is that imposing a higher tariff rate will not impact the U.S. automobile industry. However, since international companies have trade contacts with China, the higher tariff rate will have some negative impact on American automobile international companies.

Conclusion

This paper aims to find some potential impact of imposing a higher tariffs rate on automobiles, which are import from America to China. By using a linear regression model, we find that a higher tariffs rate has not influenced the sales volume of vehicles. However, the exports of U.S. automobiles to China decrease a lot. As a consequence, the international automobile companies in America are facing a challenge. This research selected Ford Company, General Motor Company and Fiat Chrysler Company as the representative international automobile companies to analyze the influence of tariffs rate on firms. The results show their market share or industry demand in China decreases a lot. And their average daily return of stock decreases after the Chinese government announces that higher tariffs rate will be imposed. Therefore, the researcher believes imposing a higher tariffs rate has a negative impact on the U.S. automobile industry.

Limitations and contributions

This study contains several limitations that can be improved in further research. First, this study only considered average tariffs rate instead of specific tariff rates on different items; in the future, more accurate and proper analysis can be done. The tariff rates of automobile parts are varied, and the price of automobile parts will have a different influence on the price of vehicles. Therefore, the tariff rates of automobile parts play an essential role in affecting the sales volume of automobiles. By considering how the different tariffs rate influences the automobile industry, the result will be more precise and meaningful. Second, not only tariffs rates will influence the automobile industry, but also other factors may impact the automobile industry, such as brand effect, consumer boycotts and consumers' heterogeneous responses. Failed to consider other factors that may make the result of this study less reliable. Third, although the selected companies are very representative, there still exists some possibility that they cannot represent the whole market. This research failed to consider whether the tariffs rate will impact on those companies who do not have trade with China.

Except for those limitations, this study also has several contributions to many areas. This study considered the impact of tariffs on the sales of a whole market - the U.S. automobiles industry, including both international automobile companies and domestic automobile companies. Since the exports and imports of automobiles take a large account in the U.S. economy and the price of automobile closely related to people's quality of life. The result of this research may reveal some potential outcome of the trade war, which can give a clue to people that the truly effect of tariff rates and how the impose of higher tariffs rate influences their lives.

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