



温州肯恩大学  
WENZHOU-KEAN UNIVERSITY

**US-China trade war and its impacts on stock markets**

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by

ZHANG Panfeng

1025985

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## **ABSTRACT**

This thesis explores the effects of the trade war on the stock markets in the US and China mainland. To understand the general situation of the trade, policies were listed in this thesis. Meanwhile, the movements of representative stock indices, which used to measure the performance of the two stock markets in this period, were analyzed using standard deviation and correlation test. This thesis quantifies policy change with the trade policy uncertainty indices and uses regression tests to investigate their effects on the stock indices. This thesis also exploits whether certain announcements can influence the stock markets in the short run, using the difference in means test. The results illustrate that trade policy uncertainty had positive effects on the stock market of the US, while influenced that of China inversely. Besides, the stock market in China mainland was affected more than the US one to some extent. Last but not least, the sudden trade war policy announcements have significant influences on indices price in the short run. The results also give evidence for investors to adjust the asset allocation. Investors in these two stock markets need to pay close attention to relative policy changes.

## 1. INTRODUCTION

The US-China trade war is the ongoing conflict between these two economically powerful countries. Started from March 2018, when Trump tried to add 25% of tariffs on steel and 10% on aluminum imported from China (Fetzer and Schwarz, 2019), the trade war caught people's attention tightly. In the following one and a half years, the US changed the existing policies frequently, while China made forcible responses as well. Besides changing tariff correspondingly, China even adjusted the foreign exchange rate and the required reserve ratio. Until early October in 2019, the US and China got into an agreement about tariffs to some extent.

While the reasons for Trump, the US president, to initiate the trade war are not only derived from the commerce situation. Though bilateral trade imbalance acted like the most direct and important one, there were still other persuasive underlying factors. Many scholars referred to the *Made in China 2025* project and analyzed for political and technological perspectives. Mattoo and Staiger (2019) discussed "the US hegemony phase", indicating those sanctions were used to prevent the "Chinese dominance" to happen. Besides, technology was a significant issue, as the US was afraid that Chinese development would threaten its safety and result in unfair technological competition (Ciuriak, 2019).

When it comes to the impact of the trade war, the findings are quite complexed. Although the trade war was started by the US, not all the results were in its favor. China is facing economic losses brought by the increased tariff. On the other hand, tariff-related policies also increase the cost of imported Chinese goods for American corporations. Therefore, the US saw adverse effects on firm-level (Huang, Lin, Liu and Tang, 2019), also on income and welfare fields (Amiti, Redding and Weinstein, 2019).

While different industries and regions were influenced differently. As for the relationship to the stock markets, mainly focused on the US and Chinese ones, negative trade war policies led to decreases in indexes in both countries. There are other factors that influence the stock markets and policies made indirect contributions to the stock market through them.

The US-China trade conflict not only affected the two countries but also influence the whole world. This is not surprising because of the globalization. Researchers also showed uncertain predictions upon investment trends, as the trade war policies are not stable.

This proposed thesis compares the policy timeline with the changes of indexes, with the purpose to analyze the impact of the US-China trade war on the stock markets. During the conflict, every movement had nonnegligible influences. To analyze data collected, correlation test, regression test and the difference in means test are adopted. For the regression test, there is a simple model that Indices prices (US/China) =  $\beta$  (TPU of the US/China) +  $\alpha$ . Previous research on this issue is limited, also almost did not expand on such a long period. In the two powerful countries, the new announcements presented in 2019 provide new risks and opportunities.

This study will contribute to figuring out the relationship between trade policies and stock markets as well as possible following changes. There are also some investment suggestions given to the investors involved in the two countries' stock markets.

## **2. LITERATURE REVIEW**

This thesis refers to several strands of papers relating to the US-China trade war and stock markets. The following listed their findings, categorized by background, impacts and predictions of the trade war.

### **2.1 Background of the China-US Trade War**

#### **2.1.1 Policy Timeline**

Many scholars consider March 2018 as the start time of the China-US trade war. According to Fetzer and Schwarz (2019), on March 1, the United States announced a 25 percent tariff on imported steel and a 10 percent tariff on imported aluminum from China. Three weeks later, the US issued an influential policy, “which proposed 25% tariffs on over \$50 billion worth of Chinese imports” (Huang et.al, 2019). For China’s responses, Rauhala (2018) listed that the Ministry of Commerce of China imposed tariffs on 128 products imported from the United States, “including aluminum, airplanes, cars, pork, and soybeans”.

On July 6, 2018, America imposed a 25 percent tariff on \$34 billion of Chinese imports and planned to impose a 25 percent tariff on another \$16 billion worth goods that came from China on August 23. (Liu and Woo, 2018). WTO posted on its official website that “China filed a new WTO complaint against the US regarding the additional tariffs” (2018).

The two countries kept fighting in the remaining years in 2018. At last, in December, the planned tariff increase has been put off (Jeff and David, 2018). Trump restarted the trade conflict by stating that “tariffs on \$200 billion of Chinese goods will

increase to 25% on Friday” (Spencer, 2019) on May 5, 2019. Ten days later, the US president signed “executive order targeting Huawei” in terms of communication safety (CNBC, 2019). According to Jacob (CNBC, 2019), China would react by raising tariffs on US goods worth 60 billion dollars. On August 2, Lianhe Zaobao (2019) posted that Trump said on August 1 that he would impose a 10 percent tariff on \$300 billion worth of Chinese goods from September 1. In the next four-day period, the People’s Bank of China let the yuan fall more than 2 percent against the dollar to its lowest in recent 11 years (Zhou, Stanway, Leng and Shalal, 2019). Meanwhile, China has asked state-owned companies to stop buying American agricultural products (Fickling, 2019). One big event that happened in September is that the PBOC “would cut its reserve requirement ratio by 0.5%” to cope with the slowdown of economic growth in China due to the trade war (Alexandria, 2019).

The latest news about the US-China trade war was issued on October 11. According to Wall Street Journal, because China compromised by consuming \$50 billion of U.S. agricultural products as well as adopting more American financial services in the dominant market, the US agreed to suspend new tariffs (Mauldin, Deng and Salama, 2019).

### **2.1.2 Why Trade War Happen?**

The most apparent reason is the truth that there existed an imbalance between the two countries’ trade. Ciuriak (2019) called this “the bilateral goods trade imbalance” in his study. Also, Mattoo and Staiger (2019) mentioned that bilateral trade deficits ran between the two countries led to the tariff bargain. According to Liu and Woo (2018), the US considered “China’s chronically large trade surplus was depressing” their

employment rate growth and drove Trump initiating the trade war.

Many scholars referred to the *Made in China 2025* to explain other motivations for the trade war. Based on the pro-active industrial strategies, one perspective was about power position. Mattoo and Staiger (2019) described “the US hegemony phase” in their research and then inferred that the US tends to prevent or delay the possible shift from American dominance to Chinese dominance by triggering the tariff sanctions. Zhang, Lei, Ji and Kutan (2019) also found that America’s worries “are more likely to be driven by political factors” but not economical ones. For another, as regards technology issues, forced technology transfer (Ciuriak, 2019) and secret theft concern (Liu and Woo, 2018) were also mentioned by Trump. Furthermore, Lee (2019) suggested that the movements of China to high tech industries were probably led to the negative reactions from the US.

## **2.2 Impacts of the Trade War**

### **2.2.1 General Economic Impacts (on the US and China)**

Even though it was the US that started the trade war, not all of the outcomes were beneficial to it. Li, He and Lin (2018) pointed out that the US could benefit from unilateral methods against China but would lose if China retaliated. According to Huang et.al (2019), the US experienced adverse effects by both “increases in the prices of inputs from China” and “reduction in sales in China”. This is because as tariff added, the goods’ prices will go up and discourage consumers to buy them. Amiti et.al (2019) found evidence about the income, stating that American consumers suffered from the tariff, with the loss of about \$1.4 billion loss in real income per month by the end of 2018. Interestingly, Fajgelbaum, Goldberg, Kennedy and Khandelwal (2019)

documented that “the pattern of U.S. tariffs protected sectors concentrated in electorally competitive counties, while foreign retaliations affected sectors concentrated in Republican counties”.

For corporations, the retaliatory tariffs did cause some economic damage to the affected industries (Fetzer and Schwarz, 2019). According to Huang et.al (2019), “US firms that are more dependent on exports to and imports from China have lower stock returns and higher default risks around the announcement dates”. They also stated that the reduction of import competition from China has limited impacts.

### **2.2.3 Relationship to Stock Markets**

News reporters noticed the changes in indexes after policies announced. Fickling (2019) posted on Bloomberg that “U.S. stocks strengthened on Tuesday afternoon, with the S&P ending up 1.3% a day after dropping 3%. The Nasdaq surged 1.4%” on August 5. Also, Mauldin, Deng and Salama (2019) reported a similar positive reaction of the US stock market after the agreement issued in October. Amiti et.al (2019) paid attention to the Chinese equity market and then found corresponding volatile when some of the most important trade policies announced. In a research paper, Huang et.al (2019) found that Chinese listed firms that are more dependent on sales in the US suffered from the policy shock, also the weighted average of import tariffs for American companies has a negative correlation with the cumulative stock returns over the three days before and after the announcement. However, Bianconi, Esposito and Sammon (2019) got different findings and argued that “US manufacturing industries more exposed to trade policy uncertainty experienced significantly higher stock returns than less exposed industries.”

Scholars also gave information about other factors that can influence the stock market. While the policy may affect these aspects, indirectly contributing to the changes in stock markets. Regarding the macro-economic level, Pan and Mishra (2018) stated that “any economic growth would influence the financial market, which represents the causal relationship between the growth in the real output of the economy and the growth of stock markets.” When it comes to the labor market, according to Baker, Bloom and Davis (2016), renovations in policy uncertainty indicate decrease trends in investment, output, as well as employment in the United States at the macro level. Besides, Freeman (2004) found that trade policies can not only put a huge impact on economic outcomes but also, especially, on how workers fare in the labor market, which has the possibility to cumulate on stocks.

### **2.3 Predictions about the Future Course of Trade War**

The US-China trade war not only affected the two countries but the whole world. Ciuriak (2019) predicted that “the outbreak in 2018 of a rapidly escalating trade war between the United States and China is a watershed event that is reshaping the global economic and political order.” According to Steinbock (2018), the ongoing U.S.-China trade tensions could lead to a severe global recession, and the author foresaw “the U.S. and China may reach a trade deal based on enforceable Chinese commitments”. The recent “phase one” agreement confirmed this argument, which is also possible in the future. In this case, many countries may try to temper the competition between these two countries (Choer, Roberts and Ferguson, 2019).

Some researchers show unsure attitudes about future investment choices. For example, according to Brar (2018), in terms of the persistence of uncertainty, which

gives out confusing signals, economic decision making would be difficult to some extent. Li and Peng (2017) also admitted the policy uncertainty and suggested that investors pay close attention to movements of the trade to rebalance the proportion of Chinese or US stocks in their portfolios. While Huang et.al (2019) gave a general statement by considering the global value chains which are shared by the US and China, that the winners and losers in the trade conflict will be identified by the firms' positions and exposure level.

### **3. METHODOLOGY & DATA**

After introduction and literature review, in which some answers of research questions were given, this section is about data and methodology used in quantitative analysis.

#### **3.1 Discussion of Data and Sample**

The following paragraphs are about the data used to illustrate the influences of the Us-China trade dispute on the stock market. This thesis focuses on comparing the stock markets' performance in the two countries, taking policy shocks into account simultaneously.

##### **3.1.1 Discussion and Explanation of Data Set**

To measure the impact of the trade war on stock markets in China and the US, indices are useful because they include the representative firms in the markets. Three important indices in America: Dow Jones Industrial Average, S & P 500 and NASDAQ Composite and two major indices in China mainland: Shanghai composite index and SZSE component index are selected. This thesis sourced data from Yahoo Finance for the formal ones and from Investing.com. for the latter ones. The daily frequent data, combined with the policy timeline, were used to identify the relationship between released policies and stock indices changes to identify whether there are immediate influences of these policies. The monthly ones can show the volatility of the stock markets as well as the possible relationship with the policy in an overall and long-term view. Also, the monthly return rates were calculated.

Monthly data for trade policy uncertainty indices between January 2017 and the end of 2019 were used, too. The value of TPU indicates the degree of uncertainty of the US or China's trade policy. Using monthly series rather than more frequent ones is mainly because of the concern of high-frequency noise that could "dilute the effects of policy uncertainty in both China and the US" (Zhang et.al, 2019). According to the website, the data for the US came from the Access World News database of more than 2,000 US newspapers. Similarly, the data for China mainland are developed by Davis, Liu and Sheng (2019) based on mainland newspapers. Many empirical studies have explored the influence of policy uncertainty on stock markets by using Baker et al.'s EPU measures (see, e.g., Li and Peng, 2017), while this thesis mainly focuses on the impacts of the trade war, and thus using TPU is more reasonable. The country-level data for China and America were found on the [policyuncertainty.com](http://policyuncertainty.com).

### **3.1.2 Discussion of Sample**

Because the trade war started in March 2018 and continuous until now, this thesis chose data for the latest 3 years (from 2017 to 2019) for the US and China stock markets. In this case, the trade war period condition can be compared with the resent situation. The monthly data sets contain more than 30 observations each, with five categories for stock indices and two categories for TPU. Besides, data appeared around certain days, on which important trade policies were announced, are picked and compared. Also, all spans of observations selected were not less than 30.

Here is the table shows the variables and their sources.

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**Table 1.** Variables and source

<b>Variables</b>	<b>Abbreviations</b>	<b>Source</b>
Dow Jones Industrial Average	DJI	Yahoo Finance
S & P 500	GSPC	Yahoo Finance
NASDAQ Composite	IXIC	Yahoo Finance
Shanghai composite index	SSEC	Investing.com
SZSE component index	SZI	Investing.com
Trade Policy Uncertainty Indices	TPU	policyuncertainty.com

### **3.2 Discussion of Methodology & Model**

The following paragraphs are about the methodology and model. To interpret the data found, besides comparing the change before and after a trade war-related policy was related, correlation test, regression test and the difference in means test will be used to get overall views.

#### **3.2.1 Discussion and Explanation of Methodology**

Besides calculating returns and standard deviation, this thesis mainly adopted three kinds of methodologies: correlation test, regression test and the difference in means test.

Firstly, the standard deviation was calculated to measure the volatility of the indices' return rates. This part was divided into two parts, one is for Dow Jones Industrial Average, S & P 500 and NASDAQ Composite and another is for Shanghai composite index and SZSE component index. This thesis calculated the  $\sigma$  for each series of indices return rates in 2017, 2018 and 2019 respectively and compared them. The higher the Standard deviation for return rates, the more volatile the stock market. Therefore, if there were higher  $\sigma$  in the years 2018 and 2019, and as the fact that the trade war lasts for these periods but not in 2017, it has negative effects on the stock market generally.

Correlation refers to the degree of linear dependence of the movements in the US stock market and China's one. The sum of different indices in the two countries will be calculated and then generate "indices change in the US stock market" and "indices change in China's stock market". Finally, use Excel to do the correlation test and interpret the result.

The regression test aims to find the relationship between trade policy uncertainty indices and stock index changes. As monthly indices for trade policy uncertainty and average of stock markets indices are given, the situation in the two countries was analyzed respectively. Many scholars studied the relevance between the EPU indices and the changes in the stock market. For example, Zhang et.al. (2019) apply this idea to the global stock market. While this thesis only talks about the US-China trade war and the stock markets in these two countries, only trade policy uncertainty indices were adopted.

This thesis also uses the difference in means test to find out whether a certain policy has impact on the stock markets. Huang et.al. (2019) used the event-study approach in their research about trade war's impacts on firm value. They compared the public interest of trade war with the movements of stock indices, then analyzed the changes in three-day windows. Similarly, this thesis adopts the general idea and selects two significant announcements. The first one is on March 22, 2018, and the second one, which happened quite recently, is on October 11, 2019.

### **3.2.2 Discussion and Explanation of Model and Hypotheses**

For the regression test, assume Indices prices (US/China) =  $\beta$  (TPU of the US/China) +  $\alpha$ . The aim is to find out whether  $\beta$  is a significant number, that is, whether

changes of TPU indices have significant impacts on stock markets. The H0 is: the policy uncertainty indices have no impact on that countries' stock indices, which means there is no relationship between policy issue and index change. The regression test will be run twice: Y1 is trade policy uncertainty in the US and X1 is the sum of Dow Jones Industrial Average, S & P 500 and NASDAQ Composite at the same time periods. Y2 is trade policy uncertainty in China and X2 is the sum of Shanghai composite index and SZSE component index at the same time periods.

There are the predicted results for the data analysis. Firstly, all indices were more volatile in 2018 and 2019 than in 2017. Secondly, the stock indices in the US and China had the trend of moving together. Thirdly, the negative trade policy has negative effects on the stock markets, whereas positive announcements can bring positive results. And generally, there was a negative relationship between the trade policy uncertainty and the changes in indices.

The next step is to analyze the data by these methodologies.

## 4. ANALYSIS & FINDINGS

Using the methodology and data presented in the previous part, here are the findings and discussions.

### 4.1 General Picture of the Trade War

The US-China trade war began in early 2018 and lasts until now. Related policies attracted the public's attention, thus influenced investors' behaviors toward the stock markets in the two countries. This point is generated from the general analysis of standardized deviation and correlation test for movements in stock indices of the two stock markets in recent three years.

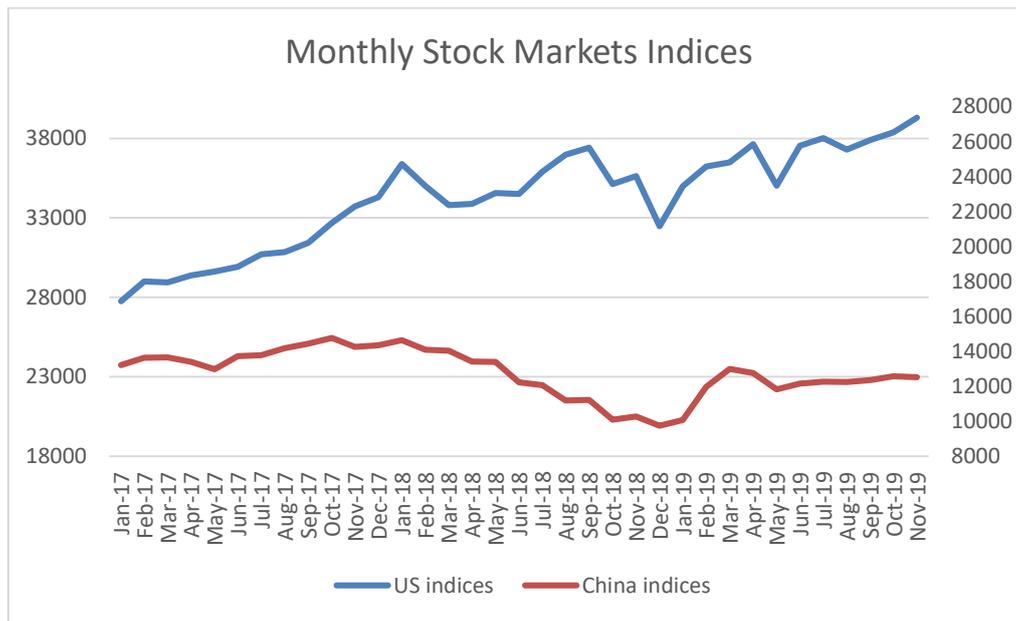
The policy timeline was listed in the previous section of this thesis, so how was the situation of stock markets in both countries during this period? To show how volatile the stock markets were, the  $\sigma$  of return rates in the years 2017, 2018 and 2019 were calculated and compared. As figure 1 shown, both the US and China saw higher standard deviations for monthly indices return rates during 2018 or 2019 than that during 2017. Therefore, the performances of stock markets during the trade war in these two countries were worse than those in 2017.

**Figure 1.** Standard deviation for monthly indices return rates

	$\sigma$ for 2017	$\sigma$ for 2018	$\sigma$ for 2019 (till November)
USA	1.49	4.37	4.24
China	3.17	4.30	7.64

Figure 2 is the result of the correlation test, concerning to provide a general view of the co-movement of the stock indices prices in the two markets. The negative correlation result shows the two series of indices move toward different directions to some degree.

**Figure 2.** Stock indices correlation result



(the left scale for the US, the right scale for China)

#### 4.2 Effects of Policy Uncertainty: Regression Tests

To answer the question that how the trade war-related policy affected the stock market, the relationships between TPU indices and stock indices provide the general images. The results can contribute to giving suggestions to investors.

Figure 3.1 and 3.2 give information about the results of the regression test to find out whether the US trade policy uncertainty indices have impacts on the stock indices. This thesis uses the model:  $\text{Indices prices (US)} = \beta (\text{TPU of the US}) + \alpha$  to exam the situation during the recent three years. The null hypothesis (H0) is that the policy uncertainty indices of the US have no impact on the country's stock indices. The test results have a  $R^2$  larger than 0.2 and a P-value lower than 0.1 so the null hypothesis should be rejected. As the chart shows, the US TPU has a positive influence on the stock indices prices, which is kind of surprising.

**Figure 3.1.** Regression test result for the US

	Coefficients	t Statistic	P-value
TPU of the US	3.90152260207711	3.41801669606402	0.00173690707326444

**Figure 3.2.** Regression test for the US: TPU over stock indices prices

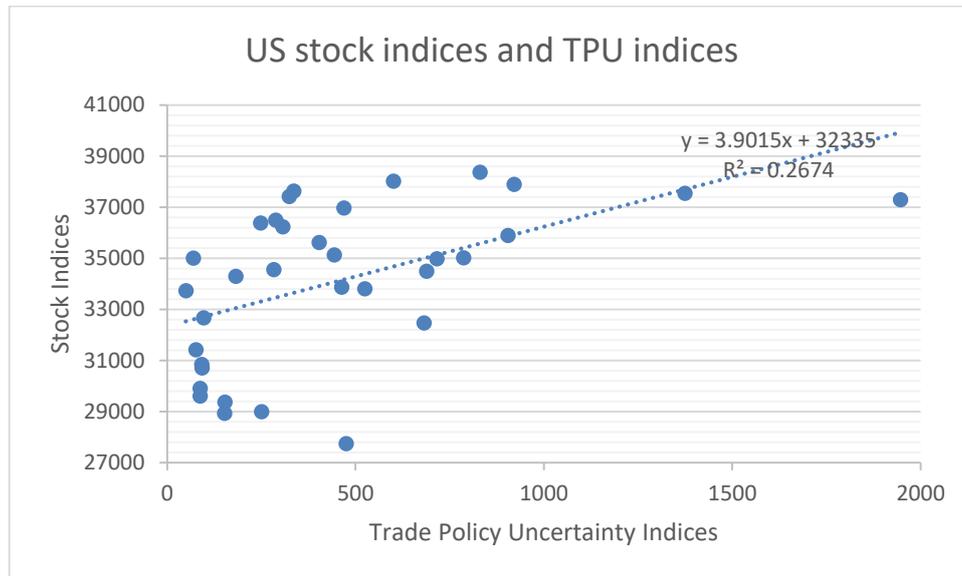


Figure 4.1 and 4.2 give information about the results of the corresponding regression test for situations in China. Similarly, the model is: Indices prices (China) =  $\beta$  (TPU of China) +  $\alpha$ , and the null hypothesis ( $H_0$ ) is that the China's policy uncertainty indices do not have impacts on the country's stock indices. The  $R^2$  is larger than 0.2 and because the P-value is also less than 0.1, the null hypothesis should be rejected. While, as the results present, the trade policy uncertainty affected the stock indices inversely.

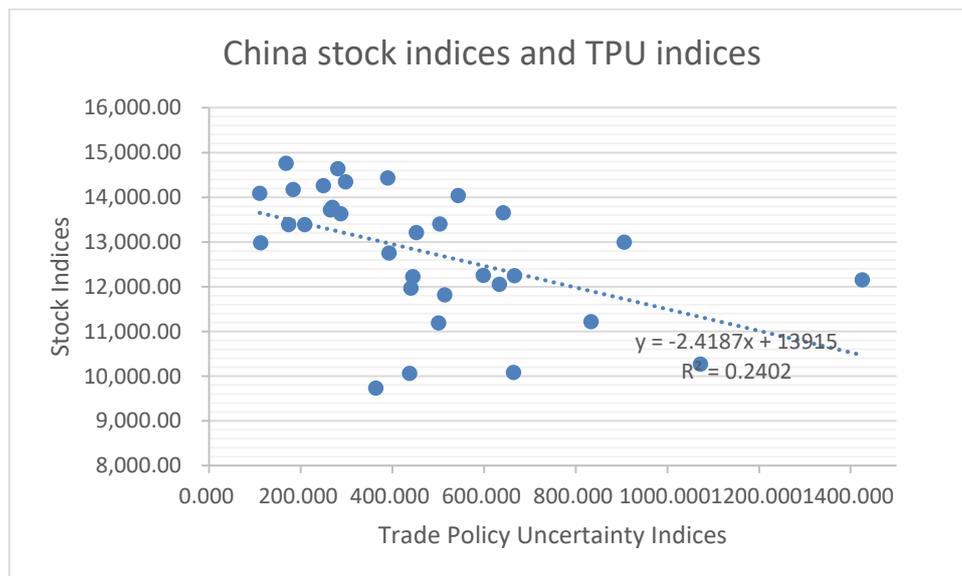
Zhang et.al. (2019) studied how the economic policy uncertainty in the US and China influenced the global stock markets. They also use policy uncertainty indices and stock indices as observations, but a longer time period. The results are that both countries' EPU can influence the global market in different degrees, but the US one has dominated effects. Analyzing observations with similar properties, this thesis also found significant relationships that exist between the trade policy uncertainty and the

performances of stock markets in the US and China. While for a specific period, the influences went in different directions. In addition, the difference in the coefficients indicates that in the same trade war period, the stock market of the US was influenced slightly more than that of China.

**Figure 4.1.** Regression test result for China

	Coefficients	t Statistic	P-value
TPU of China	-2.41868867315197	-3.07938496680387	0.00440980675513633

**Figure 4.2.** Regression test for China: TPU over stock indices prices



There are some possible reasons. Firstly, many trade war-related policies were in favor of the US, so the uncertainty may have limited influences on the investors' sentiments. Second, the stock market in the US is more mature than that in China, so its market self-adjust ability is better, maintaining the growth trend of the stock market. While governments in China mainland have implemented some monetary policies to stimulate investments in its stock market.

In this case, the difference in means test is used to identify the sudden effects of certain announcements in the short run.

### 4.3 Closer Picture: Difference in Means Test

As mentioned previously, Trump tended to apply additional tariffs on more than \$50 billion Chinese import goods. Stock markets in both the US and China saw decreases in indices between March 21, 2018 and March 23, 2018. Besides, Trump announced that the two countries reached an agreement on October 11, 2019. Then the indices all increased between October 10, 2019 and October 14, 2019. These direct observations of changes indicate that stock markets responded to certain announcements. To check this idea, the difference in means test was applied.

For the event that happened on March 22, 2018, the two t-Test: Two-Sample Assuming Unequal Variances result both present P-values far lower than 0.1. Thus the thesis rejects the null hypothesis: there is no difference in mean indices of the stock market in the US/China between 30 days before and after March 22, 2018. When it comes to the influence of the announcement on October 11, 2019, the respective null hypotheses are also rejected. In a word, this thesis finds that trade policy shocks have significant influences on stock price in the short run. Figure 4 lists the results for the tests.

**Figure 5.** Difference in means tests for two events

H0: there is no difference in mean indices of stock markets between 30 days before and after March 22, 2018.			
	Mean before	Mean after	<b>P (two-tail), Result</b>
US	\$34879.62	\$33936.54	<b>8.3328E-10, reject</b>
China	¥13950.45	¥13470.12	<b>2.102E-08, reject</b>

H0: there is no difference in mean indices of stock markets between 30 days before and after October 11, 2019.			
US	\$37714.28	\$38756.84	<b>3.051E-09, reject</b>
China	¥12474.72	¥12633.52	<b>0.0039, reject</b>

Huang et.al. (2019) used the event-study approach to measure how the market of listed firms in the US and China responded to certain trade war announcements. They picked date March 22, 2018 and April 3 and 4, 2018, and found significant responses to these announcements existed in both countries. Though this thesis adopts the different methodologies, the results are consistent with those of Huang et.al. (2019).

To sum up, the findings show that the trade war-related policies had impacted the stock markets, and investors need to pay close attention to the policy change. If the trade war continues in the future, investors in these two markets, especially for those have portfolios including stocks in both US and China market, could change the distribution properly. For example, decrease investments in fields that have a high possibility to be affected by future tariff policies. Investing in the US stock markets is a bit safer than in China's, while based on the belief that the US-China trade war will not last forever, its impacts on stock markets will be less and less as time goes by.

## 5. CONCLUSION

The focus of this thesis is on exploring the relationship between the US-China trade war and the stock market movements in the two countries. Refer to the timeline, and quantify the situation using trade policy uncertainty indices (TPU), the trade war impacts on stock indices are tested by the correlation test, the regression test (apply a simple model: Indices prices (US/China) =  $\beta$  (TPU of the US/China) +  $\alpha$ ) and the difference in means test. The findings are summarized as follows. First, the stock markets were more volatile in 2018 and 2019 compared to their performance in 2017. Also, the two series of indices developed in different directions to some extent. Second, the US TPU has a positive influence on the stock indices prices in the country's market, but China's TPU affected its stock indices inversely. While the stock market of the US was affected slightly more than that of China by the uncertainty. This difference can be explained by the different effects of the trade war policy for the two countries and the property of the two stock markets. Third, both the negative announcement on March 22, 2018 and the positive one on October 11, 2019 have significant influences on stock markets in the short run in the two nations.

This thesis has some contributions. There were limited previous studies on this issue, and relative papers did not investigate the US-China trade war for such a long period. In this case, this thesis helps people understand this trade war, also provides information about possible policy impacts on the stock markets. Concerning the results, this thesis can give suggestions to investors in the two countries' stock markets that pay close attention to the policy shocks, especially for those holding portfolios containing both the US and China's stocks. As there were no important new announcements issued recently, the US-China trade war could continue. Investing in the stock market of the

US may be less risky, while China's market can adjust the changes when dealing with policy hikes. However, this thesis still has some limitations. When analyzing the long-term effects, conditional volatility was not filtered, nor did that of other economic policies. Besides, it only focuses on representative indices prices but not including trade volume and bid-ask spreads. Also, there exist other factors that may affect the stock markets, such as changing the exchange rate. These issues were left for further research.

## 6. REFERENCES

- Amiti, M., Redding, S. J., & Weinstein, D. (2019). *The impact of the 2018 trade war on US prices and welfare* (No. w25672). National Bureau of Economic Research.
- Baker, S. R., Bloom, N., & Davis, S. J. (2016). Measuring economic policy uncertainty. *The quarterly journal of economics*, 131(4), 1593-1636.
- Bianconi, M., Esposito, F., & Sammon, M. (2019). Trade Policy Uncertainty and Stock Returns. *Available at SSRN 3340700*.
- Brar, J. (2018). Factors in the Eruption and Persistence of Sino-US Trade War. *Sino-US Trade War: A New Challenge to Globalisation*, 22.
- ["China initiates WTO dispute complaint against additional US tariffs on Chinese imports"](#). Retrieved November 20, 2018.
- Choer Moraes, H., Roberts, A., & Ferguson, V. (2019). Toward a Geoeconomic Order in International Trade and Investment. *Journal Of International Economic Law*, 22(4).
- Ciuriak, Dan, The US-China Trade War: Technological Roots and WTO Responses (February 6, 2019). *Global Solutions Journal* 4, March 2019: 130-135. Available at SSRN: <https://ssrn.com/abstract=3330392> or <http://dx.doi.org/10.2139/ssrn.3330392>
- Davis, et al. "China Policy Uncertainty Indices Based on Mainland Papers." *Economic Policy Uncertainty Index*, [https://www.policyuncertainty.com/china\\_monthly.html](https://www.policyuncertainty.com/china_monthly.html).
- Fajgelbaum, P. D., Goldberg, P. K., Kennedy, P. J., & Khandelwal, A. K. (2019). *The return to protectionism* (No. w25638). National Bureau of Economic Research.
- Fetzer, T., & Schwarz, C. (2019). Tariffs and politics: evidence from Trump's trade wars.
- Fickling, D. (August 5, 2019). ["China Is Playing Trump on Trade: Holding off on big agricultural purchases now is a low-cost, high-opportunity strategy"](#). *Bloomberg*.
- Freeman, R. B. (2004). Trade wars: The exaggerated impact of trade in economic debate. *World Economy*, 27(1), 1-23.
- Huang, Y., Lin, C., Liu, S., & Tang, H. (2019). 7 Supply chain linkages and financial markets: Evaluating the costs of the US-China trade war. In *Trade War: The Clash of Economic Systems Endangering Global Prosperity* (pp. 65-72). CEPR Press.
- Lee, B. (2019). Assessing Made in China 2025, the US-China Trade War and Ways Going Forward. [https://scholarship.claremont.edu/cmc\\_theses/1996/](https://scholarship.claremont.edu/cmc_theses/1996/)
- Li, C., He, C., & Lin, C. (2018). Economic Impacts of the Possible China-US Trade War. *Emerging Markets Finance and Trade*, 54(7), 1557-1577.

- Li, X. M., & Peng, L. (2017). US economic policy uncertainty and co-movements between Chinese and US stock markets. *Economic Modelling*, 61, 27-39.
- Liu, T., & Woo, W. T. (2018). Understanding the US-China trade war. *China Economic Journal*, 11(3), 319-340.
- Mattoo, A., & Staiger, R. W. (2019). 3 Understanding trade war. In *Trade War: The Clash of Economic Systems Endangering Global Prosperity* (pp. 33-42). The World Bank.
- Rauhala, Emily (April 4, 2018). ["China fires back at Trump with the threat of tariffs on 106 U.S. products, including soybeans"](#). *The Washington Post*. ISSN 0190-8286. Retrieved April 4, 2018.
- Kimball, Spencer (May 5, 2019). ["Trump says tariffs on \\$200 billion of Chinese goods will increase to 25%, blames trade talks"](#). *CNBC*. Retrieved May 6, 2019.
- Pan, L., & Mishra, V. (2018). Stock market development and economic growth: Empirical evidence from China. *Economic Modelling*, 68, 661-673.
- Pramuk, Jacob (May 13, 2019). ["China is raising tariffs on \\$60 billion of US goods starting June 1"](#). *CNBC*. Retrieved October 12, 2019.
- Salama, William Mauldin and Vivian. ["U.S., China Reach Tentative 'Phase One' Trade Pact"](#). *WSJ*.
- Scott R. Baker, Nicholas Bloom, Steven J. Davis, Measuring Economic Policy Uncertainty, *The Quarterly Journal of Economics*, Volume 131, Issue 4, November 2016, Pages 1593–1636, <https://doi.org/10.1093/qje/qjw024>
- Steinbock, D. (2018). US-China Trade War and Its Global Impacts. *China Quarterly of International Strategic Studies*, 4(04), 515-542.
- Stevenson, Alexandria (September 6, 2019). "China Injects \$126 Billion Into Its Slowing Economy". *The New York Times*. The New York Times Company.
- Stock Market Quotes & Financial News. (n.d.). Retrieved from <https://www.investing.com/>.
- ["Trump signs executive order targeting Huawei"](#). *CNBC*. May 15, 2019.
- Winni Zhou, David Stanway, Cheng Leng, Yawen, Andrea Shalal (August 6, 2019). ["China media says U.S. 'destroying international order', after currency-manipulator branding"](#). *Reuters*.
- Zhang, D., Lei, L., Ji, Q., & Kutan, A. M. (2019). Economic policy uncertainty in the US and China and their impact on the global markets. *Economic Modelling*, 79, 47-56.

## **7. TABLES AND FIGURES**

Table 1: Variables and sources

Figure 1: Standard deviation for monthly indices return rates

Figure 2: Stock indices correlation result

Figure 3.1: Regression test result for the US

Figure 3.2: Regression test for the US: TPU over stock indices prices

Figure 4.1: Regression test result for China

Figure 4.2: Regression test for China: TPU over stock indices prices

Figure 5: Difference in means tests for two events

## 8. APPENDIX

### Appendix A: Stock indices correlation result

	Column 1	Column 2
Column 1	1	
Column 2	-0.39249	1

### Appendix B: Regression test for the US: TPU over stock indices prices

Regression Statistics	
Multiple R	0.517152652
R Square	0.267446865
Adjusted R Square	0.24455458
Standard Error	2680.863303
Observations	34

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	83964885.35	83964885.35	11.68283813	0.001736907
Residual	32	229984897.5	7187028.048		
Total	33	313949782.9			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	32334.68208	691.8628302	46.73568324	5.0295E-31	30925.40361	33743.96055
X Variable 1	3.901522602	1.141458029	3.418016696	0.001736907	1.576448682	6.226596522

## Appendix C: Regression test for China: TPU over stock indices prices

Regression Statistics	
Multiple R	0.490073307
R Square	0.240171846
Adjusted R Square	0.214844241
Standard Error	1266.369318
Observations	32

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	15207181.52	15207181.52	9.482611774	0.004409807
Residual	30	48110737.48	1603691.249		
Total	31	63317919.01			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	13915.46173	431.2299506	32.26923758	7.47598E-25	13034.77268	14796.15078
X Variable 1	2.418688673	0.785445373	3.079384967	0.004409807	4.022782124	0.814595222

## Appendix D: Difference in means tests for the announcement on March 22, 2018

### The US:

	Variable 1	Variable 2
Mean	34879.61857	33936.54368
Variance	302943.3274	184273.089
Observations	30	30
Hypothesized Mean Difference	0	
df	55	
t Stat	7.400240846	
P(T<=t) one-tail	4.16638E-10	
t Critical one-tail	1.673033965	
P(T<=t) two-tail	8.33277E-10	
t Critical two-tail	2.004044783	

**China:**

	Variable 1	Variable 2
Mean	13950.44933	13470.12067
Variance	112706.4314	41364.25749
Observations	30	30
Hypothesized Mean Difference	0	
df	48	
t Stat	6.702535485	
P(T<=t) one-tail	1.0513E-08	
t Critical one-tail	1.677224196	
P(T<=t) two-tail	2.1026E-08	
t Critical two-tail	2.010634758	

**Appendix E: Difference in means tests for the announcement on October 11, 2019****The US:**

	Variable 1	Variable 2
Mean	37714.28415	38756.84176
Variance	247669.7108	407228.8982
Observations	30	30
Hypothesized Mean Difference	0	
df	55	
t Stat	7.056245121	
P(T<=t) one-tail	1.52545E-09	
t Critical one-tail	1.673033965	
P(T<=t) two-tail	3.05089E-09	
t Critical two-tail	2.004044783	

**China:**

	Variable 1	Variable 2
Mean	12474.72233	12633.52333
Variance	63806.55038	17897.50204
Observations	30	30
Hypothesized Mean Difference	0	
df	44	
t Stat	-3.0429307	
P(T<=t) one-tail	0.001971453	
t Critical one-tail	1.680229977	
P(T<=t) two-tail	0.003942906	
t Critical two-tail	2.015367574	