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The Sino-US conflict Section 301 effects the trend of the trade between China and Asian countries based on the bilateral trade from 2013 to 2022

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Abstract: **This paper studies the impact of the Sino-US trade conflict Section 301on bilateral trade based on quarterly segmented product data between China and Asian countries from 2013 to 2022 by using DID (Differnce in diferences) model. The results show that the trade conflict between China and the United States has had a significant negative impact on China's imports from and exports to the United States but has positive impacts on trade between China and Asian countries. The DID model results indicate an increased gap between China-US trade and China-Asian trade in the post-conflict period compared to the pre-conflict period. Specifically, China's export trend to the U.S. dropped by 26.2 % points, while its export trend to ASEAN countries increased by 0.1 % points; China's import trend from the U.S. fell by 31.8% points, while its import trend from ASEAN countries rose by 12.6 % points.**

Keywords: **Trade conflict, Section 301, DID model.**

I. INTRODUCTION

Since 2017, the U.S. government has adopted a trade protectionist policy, imposing tariffs on key trade partners such as China, the European Union, and Mexico. Starting on July 6, 2018, the U.S. imposed three rounds of tariffs on Chinese products worth $550 billion, at rates of either 10% or 25%. These measures severely affected China-U.S. trade relations. According to data from the United Nations COMTRADE database, the total trade volume between China and the U.S. was $586.504 billion in 2017 (accounting for 14% of China's total trade volume), which decreased to $543.115 billion in 2019 (accounting for 12%), a year-on-year decline of over 8%. Although by 2021, China-U.S. trade volume had rebounded to $758.097 billion, its market share was only 13%. In 2022, the trade volume further increased to $761.713 billion, but the market share remained at 13%, not yet returning to the 2017 level.

As the two largest economies in international trade, with the U.S. being the world's largest economy and China's largest trading partner, how does the U.S.-China trade friction affect China's trade? China is the only country in the world with a complete, independent, and modern industrial system, boasting strong supply capabilities and potential. In light of the various trade frictions initiated by the U.S. against China, is there a trade diversion effect in China's trade with non-U.S. markets? Can other countries absorb and mitigate the risks in China's imports and exports?

From 2010 to 2020, China and ASEAN experienced a "golden decade" of cooperation, which is expected to move towards a "diamond decade" in the future. In 2010, the total trade volume between China and ASEAN was $292.236 billion (accounting for 10% of China's total trade volume), which rose to $642.146 billion in 2020, accounting for 14% of China's total trade volume, an increase of 220%. In recent years, with the global economic situation fluctuating and the process of globalization facing setbacks, unilateralism and protectionism have been on the rise. Against this backdrop, China and

ASEAN have consistently adhered to the concept of multilateral cooperation. Remarkably, even amid the significant global economic impact of the COVID-19 pandemic in 2020, bilateral trade volume not only did not decrease but increased. ASEAN even innovatively became China's largest trading partner. Among the ten ASEAN countries, Vietnam's trade volume with China was the highest, reaching $192.288 billion; Malaysia's trade volume also exceeded $100 billion; the trade volumes of Thailand, Singapore, Indonesia, and the Philippines all surpassed $10 billion; while the trade volumes of the remaining four countries (Myanmar, Laos, Cambodia, and Brunei) were below $10 billion.

The impact of the U.S.-China trade friction extends far beyond the two countries, affecting the global economy. Although the economic and trade cooperation between China and ASEAN has been strong, ASEAN countries are also feeling some impact from this U.S.-China trade conflict. In the short term, certain ASEAN countries might benefit by substituting Chinese products with their own for export to the U.S. However, the U.S. decision to impose tariffs on China is closely related to the positions of ASEAN countries like the Philippines, Malaysia, and Vietnam in the global value chain. Many electronic devices and machinery assembled in China use raw materials from ASEAN and other regional countries, leading to a chain reaction affecting these ASEAN nations. Moreover, this is just one aspect of the U.S.-China trade conflict's impact on China and ASEAN. The far-reaching, multi-dimensional, and multi-level impacts deserve further research and analysis.

This paper employs comprehensive econometric methods, using STATA18 to analyze the impact of the U.S.-China trade friction on China and ASEAN trade, aiming to answer the following questions: Have the trade trends between China and ASEAN changed before and after the U.S.-China trade friction?

II. METHODOLOGY AND RESULT

1. Methodology

This paper employs the difference-in-differences (DID) method to study the impact of the U.S.-China trade conflict on China's trade with third-party countries, specifically ASEAN countries in this case. The DID method investigates the changes in the dependent variable before and after the event in both the treated group (the U.S.) and the control group (ASEAN countries) to accurately identify the actual impact of the event.

The DID method relies on two differences. The first is the difference over time. For both the treated and control groups, we calculate the difference in average outcomes before and after the event. This time-based difference eliminates time-invariant unobserved group characteristics that confound the treatment effect on the treated group. However, removing time-invariant unobserved group characteristics alone is not sufficient to identify the effect. Even if we control for time-invariant unobserved group characteristics, there may be time-varying unobserved consequences that affect average outcomes. Therefore, we include a second difference—the difference between the treated and control groups. DID eliminates time-varying confounding factors by comparing the treated group to a control group affected by the same time-varying confounding factors as the treated group.

The study uses quarterly data from Q1 2013 to Q4 2022, with the U.S. as the treated group and seven countries—Vietnam, Singapore, Malaysia, Myanmar, the Philippines, Thailand, and Indonesia—representing the ten ASEAN countries as the control group. The model equation as follows:

$$\ln export_{it} = \alpha_0 + \alpha_1 treated*time + \alpha_2 X_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (1)$$

$$\ln import_{it} = \beta_0 + \beta_1 treated*time + \beta_2 X_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (2)$$

Where:

- $export_{it}$ represents China's export value to country i in year t; $import_{it}$ represents China's import value from country i in year t;
- **treated** is a dummy variable indicating the presence of trade conflict; it is 1 for the U.S. and 0 for ASEAN countries;
- **time** is a dummy variable for the policy impact time point; it is 0 before the trade conflict and 1 after;
- **α1** and **β1** are the DID estimators measuring the changes in China's export and import values due to the trade conflict. If these estimators are significantly negative, it indicates a reduction in trade values due to the conflict; if significantly positive, it indicates a significant positive impact;

- Xit includes control variables like the log of GDP, geographical distance, exchange rates, tariffs, population, CPI, etc.;
- μi represents country fixed effects, controlling for time-invariant characteristics affecting trade volume;
- λt represents time fixed effects, addressing omitted variables that vary over time;
- ϵit is the random error term.

The DID model assumes two key conditions: randomness in the event timing and random grouping of the experiment. The trade conflict, one of the sanctions measures taken after Trump took office, was unpredictable and unanticipated, thus meeting the randomness in timing condition. To satisfy the random grouping assumption, selecting appropriate control and treated groups is crucial. The control group should meet two basic conditions: no similar policy impact as the treated group and similar pre-conflict trade trends as the treated group. Given the significant trade volume the U.S. holds in China's trade, finding an exact match is challenging. Hence, countries with relatively high trade volumes with China among the ten ASEAN countries before the conflict were selected as the control group.

Finally, the study uses quarterly data from 2013Q1 to Q4 2022Q4 to avoid the lag effect of the trade conflict on imports and exports. With the U.S. as the treated group and seven ASEAN countries as the control group, the sample size is 40 quarters * 8 countries, total 320 observations.

Variables	Variable description	Data resources
ln_cn_exp	Logarithm of China's total exports to partner countries	http://wits.worldbank.org
ln_cn_imp	Logarithm of China's total imports to sample countries	http://wits.worldbank.org
us_friction_cn/ friction	Whether the US imposes additional tariffs on China's imports (1 for yes, 0 for no)	https://ustr.gov/ The author searched and sorted
cn_retal_us/ retal	Whether China imposes additional tariffs/retaliatory actions on US imports (1 for yes, 0 for no)	https://ustr.gov/ The author searched and sorted
ln_cn_GDP	Logarithm of China's GDP	https://databank.worldbank.org https://databank.worldbank.org
ln_partner_GDP	Logarithm of partner countries's GDP	https://databank.worldbank.org
ln_distance	Logarithm of distance from Beijing, China to the capital of partner country	https://www.timeanddate.com
ln_cn_ppl	China’s population	https://databank.worldbank.org
ln_partner_ppl	Partner country’s population	https://databank.worldbank.org
ln_cn_tariff_partner	Logarithm of China's most-favored-nation tariff on partner country's imports	http://wits.worldbank.org
ln_partner_tariff_cn	Logarithm of partner country's most-favored-nation tariff on China's imports	http://wits.worldbank.org
ln_exchange_rate	Logarithm of RMB/partner country’s currency	https://data.imf.org
ln_cn_cpi	Logarithm of China's consumer price index	https://data.imf.org
ln_partner_cpi	Logarithm of partner country's consumer price	https://data.imf.org
FTA	Whether China and partner country have signed a free trade agreement (1 for yes, 0 for no)	http://fta.mofcom.gov.cn
contig	Whether China and partner country border each other (1 for yes, 0 for no)	The author searched and sorted
language_ethic	Whether China and partner country have a common language and culture (1 for yes, 0 for no)	The author searched and sorted

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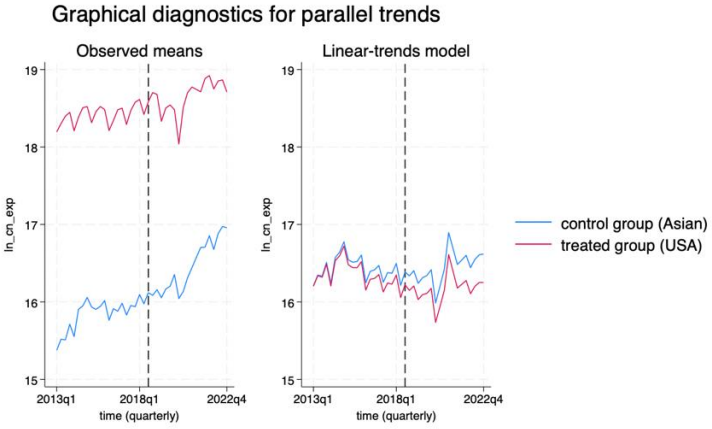
2. Result

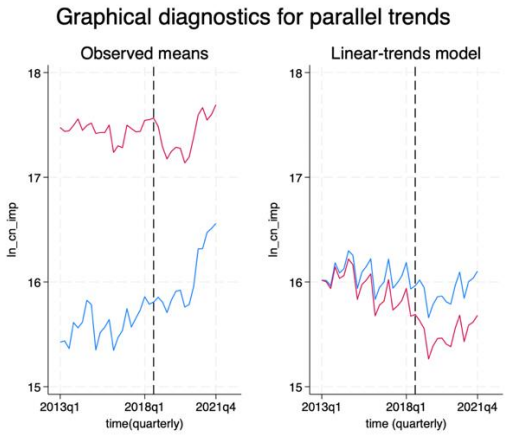
2.1 Test for DID model – parallel trends

The prerequisite for using the difference-in-differences (DID) method is to satisfy the parallel trends assumption.

As shown in Figures 2.a and 2.b, before the trade conflict impact (July 2018), the total export and import volumes between China's control group and the treated group had similar trends. However, after the trade conflict, China's imports from the treated group (the U.S.) significantly declined compared to its imports from the control group (ASEAN). Conversely, China's exports to the treated group (the U.S.) initially showed a significant downward trend compared to its exports to the control group (ASEAN), then followed a similar growth trend before falling sharply again. Therefore, Figures 2.a and 2.b visually demonstrate that the treated group and the control group satisfy the parallel trends assumption before the trade conflict.



Figures 2.a



Figures 2.b

In order to further verify the reliability of the results, this paper conducted an estat ptrends test, and the results are shown as follows:

Table 2.1: Parallel-trends estat ptrends test

Parallel-trends test (pretreatment time period) H0: Linear trends are parallel	
Export	F(1, 7) = 0.89 Prob > F = 0.3763
Import	F(1, 7) = 4.93 Prob > F = 0.1618

The estat ptrends test results indicate that there are parallel trends between the experimental group and the control group before the trade conflict, and DID regression analysis can be performed in the next step.

2.2 DID main regression result

From the results of the Table 2.2 (1) DID main regression show that the 1.treated#1.time variable has a significant negative effect at -0.263, passing the 1% significance level test. This means that compared to before the U.S.-China trade conflict, after the trade conflict, the trend of China's exports to the U.S. (the treated group) relative to its exports to ASEAN (the control group) decreased by 26.3%.

Similarly, from Table 2.2 (2), it can be seen that the 1.treated#1.time variable has a significant negative effect at -0.444, passing the 0.1% significance level test. This indicates that compared to before the U.S.-China trade conflict, after the trade conflict, the trend of China's imports from the U.S. relative to its imports from ASEAN decreased by 44.4%.

Other variable effects are consistent with expectations as the result of Gravity model. For example, GDP has a positive impact on imports and exports, while geographical distance has a negative impact.

Table 2.2 DID regression results

Variable	(1) ln_cn_exp	(2) ln_cn_imp
1.treated#1.time	-0.263** (0.0916)	-0.444*** (0.123)
ln_cn_GDP	0.860*** (0.148)	1.993*** (0.387)
ln_partner_GDP	0.993*** (0.0325)	0.950*** (0.0479)
ln_distance	-1.993*** (0.0929)	-2.280*** (0.129)
ln_partner_ppl	-0.226*** (0.0333)	0.350*** (0.0535)
ln_exchange_rate	0.0792*** (0.00762)	-0.0140 (0.0118)
ln_cn_cpi	-0.0860** (0.0280)	
contig	0.835*** (0.0837)	2.018*** (0.120)
ln_cn_tariff_partner		0.390*** (0.0552)
ln_cn_ppl		-21.89*** (5.298)
ln_partner_cpi		-0.0738* (0.0291)
_cons	-17.91*** (4.428)	253.8*** (65.16)
N	305	256
R^2	0.937	0.899

Standard errors in parentheses $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

To gain a deeper understanding of the differences in differences result, this paper uses the predictive margins to further analyze and predict through Table 2.3 for export trade and Table 2.4 for import trade.

Table 2.3 Predictive margin for export trade

Predictive margins — Number of obs = 305
Model — VCE: Conventional
Expression: Linear prediction, predict()

ln_cn_exp	Margin	std. err.	z	P>z	[95% conf.	interval]
treated#time						
0 0	16.193	0.033	485.490	0.000	16.127	16.258
0 1	16.194	0.041	398.950	0.000	16.114	16.273
1 0	17.982	0.120	149.890	0.000	17.747	18.218
1 1	17.720	0.124	142.460	0.000	17.476	17.963

Table 2.4 Predictive margins for import trade

Predictive margins — Number of obs = 256
Model — VCE: Conventional
Expression:Linear prediction, predict()

ln_cn_imp	Margin	std. err.	z	P>z	[95% conf.	interval]
treated#time						
0 0	15.899	0.041	383.360	0.000	15.818	15.980
0 1	16.025	0.058	277.130	0.000	15.912	16.138
1 0	16.156	0.159	101.310	0.000	15.843	16.468
1 1	15.838	0.172	91.860	0.000	15.500	16.176

The results of Table 2.3 are used to calculate Table 2.5, and simultaneously, the results of Table 2.4 are used to calculate Table 2.6.

From Table 2.5, it can be seen that China's exports to ASEAN increased by 0.1% point after the initiation of the trade conflict compared to before the trade conflict. Conversely, China's exports to the US decreased by 26.2% point after the initiation of the trade conflict compared to before the trade conflict. This explains the above result, indicating that compared to the period before the China-US trade conflict, after the conflict, China's exports to the United States, relative to its exports to ASEAN, experienced a difference of 26.3% point.

Table 2.5 Difference in differences for export trade

ln_cn_export	Control group (0)	Treated group (1)	Difference (1)-(0)
Pre-conflict (0)	16.193	17.982	1.789
Post-conflict (1)	16.194	17.720	1.526
Difference (1)-(0)	0.001	-0.262	**-0.263**

Table 2.6 indicates that following the onset of the trade conflict, China's imports from ASEAN increased by 1.26% point compared to the period before the conflict. In contrast, China's imports from the US decreased by 31.8% point after the conflict began, relative to the pre-conflict period. This suggests that, compared to before the China-US trade conflict, China's imports from the United States differ by 44.4% point relative to its imports from ASEAN after the conflict.

Table 2.6 Difference in differences for import trade.

ln_cn_import	Control group (0)	Treated group (1)	Difference (1)-(0)
Pre-conflict (0)	15.899	16.156	0.257
Post- conflict (1)	16.025	15.838	-0.187
Difference (1)-(0)	0.126	-0.318	**-0.444**

III. CONCLUSION

The findings of this study highlight the complex dynamics of the China-US trade conflict and its various impacts on China's trade relations with the US and ASEAN countries. The trade conflict has led to a significant reduction in trade volume between China and the US, underscoring the harmful effects of protectionist policies on bilateral trade. Conversely, the conflict has also facilitated increased trade between China and ASEAN countries, demonstrating China's adaptability and resilience in the face of external shocks. This shift in trade focus towards ASEAN indicates that China is diversifying its trade partnerships to mitigate the adverse effects of the trade dispute with the US.

The repercussions of the China-US trade conflict extend well beyond the two nations, impacting the global economy. Despite strong economic and trade cooperation between China and ASEAN, ASEAN countries have also felt the effects of the trade dispute. In the short term, some ASEAN nations may benefit by taking over certain Chinese exports to the US. However, the imposition of US tariffs on China is closely tied to the roles of ASEAN countries like the Philippines, Malaysia, and Vietnam in the global value chain. Many products assembled in China, such as electronics and machinery, rely on raw materials from ASEAN and other regions, causing a ripple effect on these countries. Furthermore, this is only one dimension of the China-US trade conflict's impact on China and ASEAN. The deep, multi-dimensional, and multi-layered consequences warrant further research and analysis.

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