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The effects of Trump's trade war with China on Japan's trade*

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Abstract

Using monthly trade data for the United States (U.S.), Japan, and China, this study investigates the effects of 45th U.S. President Trump's trade war with China on Japan's trade. Although Japan's import values and quantities of Trump-targeted goods from China did not increase, the import price did decrease slightly. Japan seems to have enjoyed a terms of trade effect because of Trump's trade war with China. Contrary to a priori expectation, Japanese industries which are linked as the upstream industry of China's (downstream) industries subjected to Trump tariffs are shown to have increased their exports to China. To investigate this unexpected result, this study analyzes China's exports of Trump tariff-targeted goods to the world and finds that China's exports of these goods to the world increased. An increase in China's exports to countries other than the U.S. more than offset the decrease in its exports to the U.S.

Keywords: Trade war, Trump, China

JEL classification: F10

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1. INTRODUCTION

"Trade wars are good, and easy to win," the 45th President of the United States (U.S.), Donald Trump, tweeted on March 2, 2018.

Did the U.S. "win" this trade war? Since 2019, the international trade literature has consistently demonstrated that President Trump's trade war diminished U.S. national welfare. Although U.S. imports of Trump-targeted goods from China would substantially decrease, the tariff-exclusive (border) price was expected to decline because of the large U.S. demand. The latter is an "improvement in terms of trade effect." The U.S., a large country in terms of its considerable domestic demand relative to total global demand, can raise its national welfare by imposing a certain level of tariffs, thereby lowering the world equilibrium price and reducing its tariff-exclusive (border) prices. If the improvement in terms of trade more than offsets the negative import volume, the net welfare effect for the U.S. is positive. The analyses in the existing literature showed that, as expected, the U.S. import volume of Trump-targeted goods from China markedly declined, depriving some U.S. customers (whether final consumers or firms) of consumption goods or intermediate inputs. However, contrary to expectations, there were no changes in tariff-exclusive (border) prices, i.e., no sign of terms of trade improvement, a somewhat embarrassing finding for U.S. policymakers and an intriguing one for trade economists.

However, the effects of Trump's trade war with China on other countries have not been investigated. One potential consequence arises for other U.S. trade partners' exports to the U.S. If Chinese firms cannot profitably sell their goods in the U.S. because of Trump's tariffs, other countries that are not subjected to these tariffs may capture U.S. demand and increase exports to the U.S. While a companion study¹ investigates this issue, this study focuses on the effect of Trump's trade war with China on the trade of Japan, China's largest neighbor. Chinese firms that suffered from a decrease in exports to the U.S. market may attempt to export to Japan, which may enjoy a welfare gain as Chinese firms try to sell their goods by reducing their sales prices. Conversely, Chinese firms that suffer because of their exports to the U.S. hit by Trump's tariffs may reduce their purchase of inputs from Japan, negatively affecting Japan's producer surplus.

This study's findings are summarized as follows:

¹ "Third country effects of Trump tariffs: Which countries benefited from Trump's trade war?", RIETI Discussion Paper Series, 22-E-007.

1. Overall, there is little change in Japan's import values/quantities of Trump-targeted goods from China. However, when considering the time lag for the reaction, an increase in extensive margins is indicated (a change in trade values from zero to positive numbers of newly traded goods).
2. The import price is observed to have decreased. Japan seems to have enjoyed a terms of trade effect because of Trump's trade war with China.
3. Contrary to a-priori expectations, Japanese industries linked as the upstream sector of China's (downstream) industries subjected to the Trump tariffs have increased their exports to China.
4. China has increased exports of Trump tariff-targeted goods to the world. Specifically, China has more than offset the negative impact of the Trump tariffs on its exports to the U.S. by increasing its exports to other countries.

2. TRUMP TARIFF

Having been sworn into office in January 2017, U.S. President Trump walked away from the negotiation table of the Trans-Pacific Partnership (TPP) "on Day One" and started renegotiating the North American Free Trade Agreement (NAFTA). In January 2018, arguing that an import surge had caused serious injury to industry—the condition for imposing safeguard duties—he imposed safeguard duties on the imports of washing machines (import duty: 50%) and solar panels (import duty: 30%) based on Section 201 of the Trade Act of 1974. In March 2018, arguing that steel and aluminum imports were a threat to national security, he imposed tariffs on the imports of steel (import duty: 25%) and aluminum (import duty: 10%). In July 2018, President Trump imposed import tariffs targeting China. Based on Section 301 of the Trade Act of 1974, he signed executive orders for three consecutive tariff increases on imports from China. This study focuses on these three Trump tariffs on imports from China. Table 1 summarizes the Trump tariffs imposed on China. The targeted products are defined using product codes with an eight-digit harmonized system (HS). There are 11,300 HS eight-digit products. The first tariff increase was imposed on 818 products, mainly composed of high-value-added products, such as industrial equipment ("List 1"). The import duty of 25% for all these products became effective on June 6, 2018. The second tariff increase comprised 279 products that were mainly industrial, such as plastics, semiconductors, and railway parts ("List 2"). The import duty was 25% for all 279 products, effective July 23, 2018. The third tariff increase covered a significantly larger number, namely, 5,745 products, which mainly included consumer products ("List 3"). The tariffs were increased in two stages. On September 24, 2018 and May 10, 2019, it grew to 10% and 25%, respectively. A total of 6,842 products were on the

list as of May 10, 2019, constituting 48.8% of the U.S.' import value from China; almost half the U.S. imports from China were subjected to the Trump tariffs in terms of import values.

3. LITERATURE

An unprecedented tariff increase by a large country, the U.S., triggered numerous essential studies on the effects of the Trump tariff on the U.S. economy. Amiti et al. (2019), Fajgelbaum et al. (2020), Cavallo et al. (2021), and Flaaen et al. (2020), among others, showed that the values and quantities of Trump tariff-targeted imports from China substantially decreased. In contrast, the tariff-exclusive prices of Trump-targeted Chinese imports at the U.S. border did not show a decreasing trend. None of the studies found a terms of trade improvement effect. Several studies of Trump's trade war on the Chinese economy have followed. Using satellite readings of nighttime luminosity, Chor and Li (2021) showed that locations within China that were more exposed to U.S. tariffs experienced a considerable decrease in night light intensity, pointing to a contraction in local economic activity. Cui et al. (2021) showed that U.S. import tariff hikes were associated with relative reductions in the entry rates of new Chinese firms. He et al. (2021) found that firms that were more exposed to U.S. tariffs in 2019 responded by posting fewer job openings in the six months following the tariff increase, a reduction of 2.4%–3.2% in the average ads per firm. Some authors have investigated the ripple effects of President Trump's trade war with China through global value chains. For example, Bellora and Fontagné (2020) encapsulated the information on sanctions and retaliation at the tariff line level into a general equilibrium framework featuring imperfect competition, recursive dynamics, and global value chains (MIRAGE-e V2). They found that, consistent with political economy determinants, these twists of value added were transmitted to the production factors, leading to sizable creation and destruction of jobs and reallocation of capital for the benefit of protected sectors, mainly at the expense of their clients. Regarding the effects on Japanese firms' activities, Sun et al. (2019) used information on Japanese multinational activities in China to show that Chinese affiliates, especially those with high exposure to trade with North America, have generally seen a decline in sales since the trade war began. To the best of my knowledge, no study has examined its effect on Japan's trade activities.

4. DATA AND METHODOLOGY

4.1. *Data*

I use monthly tariff line trade data for approximately 200 import/export partner countries drawn from the Customs Office of the Ministry of Finance, Japan. The Trump tariffs are defined at the HS eight-digit level, but the HS code is internationally harmonized only up to the six-

digit level. To ensure the consistency of the U.S. product codes at the eight-digit level with Japan's trade data at the nine-digit level, I aggregate the trade values/quantities to the HS six-digit level.

I investigate whether Japan benefited from Trump's trade war with China in terms of larger import values/quantities and lower import prices. With the concordance of the trade data to the input–output tables of China, I investigate whether Japanese industries located upstream from Chinese industries subjected to the Trump tariff experienced a decrease in their exports to China. Finally, I use monthly tariff line trade data from China, drawn from the World Trade Atlas, to investigate what happened in China's exports of Trump-targeted goods to the world.

4.2. *China's exports to Japan (Japan's imports from China)*

As argued above, existing studies have consistently shown that the U.S. substantially decreased its imports of Trump-list goods from China. This subsection analyzes whether China increased its exports to Japan for Trump-targeted goods. Figure 1 shows Japan's monthly import values from China for Trump-targeted and -non-targeted goods from January 2016 to December 2019. There is no indication that the targeted goods increased the import value. Moreover, there is no difference between the trends for non-targeted and targeted goods. Figures 2, 3, and 4 show Japan's import values for Trump-targeted goods on Lists 1, 2, and 3, respectively, from China and other countries. There is no difference between the two series in all the cases for the three lists. These descriptive analyses suggest that China did not increase its exports of Trump-targeted goods to Japan. For a more precise analysis, I estimate the following equation:

$$\ln ImpVal_{igt} = \beta_0 + \beta_1 TrumpListEffectiveDummy_{igt} + \alpha_{ig} + \alpha_{gt} + \alpha_{it} + \varepsilon_{igt}, (1)$$

where $ImpVal_{igt}$ is Japan's import value of good g from country i at time t (month/year); $TrumpListEffectiveDummy_{igt}$ takes a value of 1 if an import good g is Trump-tariff listed, country i is China, and time t is after the effective date (practically, months) of the Trump tariffs, 0 otherwise; α_{ig} , α_{gt} , and α_{it} are country-goods fixed effects, goods-time fixed effects, and country-time fixed effects, respectively; and ε_{igt} is the error term that captures unobservable shocks for a given igt . Table 2 presents the estimation results. $TrumpListEffectiveDummy_{igt}$ shows statistically insignificant coefficient estimates for all cases (Lists 1–3). As it may take time for Chinese producers to react to a decrease in their exports to the U.S. market and increase their exports to Japan (time lag), pre- and post-Trump tariffs are divided into the pre-period, which consists of six months before the effective month plus three months after the effective month (a total of nine months), and the post-period, which consists of six months after the pre-period. For example, in the case of List 1 goods, the most effective month is June 2018. Therefore, the six months from December 2017 to May 2018 and the three months from June 2018 to August 2018 (a total of nine months) were defined as the

pre-period, whereas six months from September 2018 to February 2019 are defined as the post-period. Table 3 presents the estimation results. $TrumpListEffectiveDummy_{igt}$ maintains statistically insignificant coefficient estimates. The analyses in Tables 2 and 3 involve only positive trade flows, that is, trade with zero values is not included. However, some products may have started to be exported to Japan. To address this, I include trade values from zero to positive numbers and positive numbers to zero. Taking zero trade into consideration, I estimate the equation using the Poisson pseudo maximum likelihood (PPML) model, as proposed by Silva and Tenreyro (2006) using 12-month data (six months before and after the tariff effective month/year). Table 4 presents the estimation results. All coefficient estimates for $TrumpListEffectiveDummy_{igt}$ are statistically insignificant. The estimation results in Table 5 represent the cases considering both zero trade and the time lag. The coefficient estimates for Lists 2 and 3 are statistically significant with positive signs. The estimation results in Table 5, which are somewhat different from those in Tables 2–4, are interpreted in terms of intensive margins (a change in trade values of already traded goods) and extensive margins (a shift in trade values from zero to positive numbers of newly traded goods). In the short duration of 12 months, there was little change in either the intensive or extensive margins. However, in the longer duration of 15 months, there was some indication of an increase in the extensive margins.

For quantities, I estimate the following equation.

$$\ln ImpQty_{igt} = \beta_0 + \beta_1 TrumpListEffectiveDummy_{igt} + \alpha_{ig} + \alpha_{gt} + \alpha_{it} + \varepsilon_{igt}, \quad (2)$$

where $\ln ImpQty_{igt}$ is the logarithm of the import value of good g from country i at time t (months/year). The definitions of the other covariates are the same as in Equation (1).

The estimation results are presented in Table 6. $TrumpListEffectiveDummy_{igt}$ shows statistically insignificant coefficient estimates. Table 7 lists the estimation results with time lag. The coefficient estimates of $TrumpListEffectiveDummy_{igt}$ are statistically insignificant for Lists 1 and 3 but are positive and significant for List 2. As List 2 is shorter than List 1 and much shorter than List 3, these results indicate that Japan's import quantity from China remained essentially unchanged. Table 8 shows the estimation results with zero trade, and Table 9 lists those considering zero trade and time lag. In both Tables 8 and 9, the coefficient estimates of $TrumpListEffectiveDummy_{igt}$ for List 1 are negative and statistically significant, whereas those for Lists 2 and 3 are statistically insignificant. The import quantities remain largely unchanged given the much larger number of products on List 3.

Next, I focus on unit values to study whether Japan benefited from Trump's trade war with China in terms of lower import prices from China. The following equation is estimated:

$$\ln \left(\frac{p_{igt}}{q_{igt}} \right) = \beta_0 + \beta_1 TrumpListEffectiveDummy_{igt} + \alpha_{ig} + \alpha_{gt} + \alpha_{it} + \varepsilon_{igt} \quad (3)$$

Table 10 shows the estimation results. $TrumpListEffectiveDummy_{igt}$ shows statistically insignificant coefficient estimates for Lists 1–3; Table 11 shows the estimation results with time lag. Whereas the coefficient estimate for $TrumpListEffectiveDummy_{igt}$ for List 1 is statistically insignificant, those for Lists 2 and 3 are negative and statistically significant. The number of products on Lists 2 and 3 combined is much larger than that on List 1. This result indicates that Japan’s imports from China decreased the border (tariff-exclusive) price. Japan seems to have enjoyed an indirect terms of trade improvement.

4.3. *Japan’s exports of upstream goods (inputs) to China*

In this section, I analyze whether Japanese industries that are upstream industries or suppliers of Chinese industries subjected to the Trump tariffs are negatively affected by these tariffs. When Chinese firms suffer losses in their exports to the U.S. market, they reduce their procurement of intermediate inputs from Japan. To analyze this issue, I use input–output tables, specifically, China’s international input–output table, as available in the World Input–Output Database (WIOD). However, the industry categories of the WIOD are too aggregated to investigate this issue. The WIOD comprises 56 industry categories, of which only 23 are tradable goods industries and 33 belong to the service sector. All the industries are subjected to the Trump tariffs, which cover approximately 80% of eight-digit tariff lines, as discussed above. Thus, targeted industries cannot be compared with non-targeted industries using the WIOD.

Instead, I use China’s input–output table. As China’s input–output table is domestic, not international, and includes trade with foreign countries/industries, I adopt the same proportionality assumption. In other words, the same input–output coefficients are applied to the trade with Japan. Appendix Figure A1 illustrates the application of the proportionality assumption. To ensure concordance between trade values/quantities and China’s input–output table industries, I construct a concordance table between the HS six-digit code and China’s input–output table industries. I use the most disaggregated input–output table for China for the year 2018, which has 153 industries, for precise analysis. As shown in Table 12, the trade data can be concorded for 145 out of 153 input–output industries through HS–CPC–China I–O industry code concordance, of which 53 industries belong to the service sector.

Of these 145 industries, 32, 28, and 88 industries are included in the Trump tariffs’ Lists 1, 2, and 3, respectively. Fifty six industries are not listed in any of the lists. I compare the trade in List 1–3 industries (treatment group) with trade in 56 non-listed industries (non-treatment group). For the non-treatment group, industries not listed in Lists 1–3 should be used because some sectors that had not been included in List 1 at the time of its effective date were included in Lists 2 or 3 during the sample period. The estimation equation is as follows:

$$\ln JPN_Exp_CHN_{ijt} = \beta_0 + \beta_1 TrumpListEffectiveDummy_{jt} + \alpha_{it} + \alpha_{jt} + \varepsilon_{ijt}, \quad (4)$$

where $\ln JPN_Exp_CHN_{ijt}$ is Japan's export value to China from industry i (upstream industry) to industry j (downstream industry) at time t , and $TrumpListEffectiveDummy_{jt}$ takes a value of 1 when industry j is subjected to the Trump tariffs. The estimation results are presented in Table 13. Notably, the coefficient estimates are positive and statistically significant, contrary to a priori expectations. Table 14 shows the estimation results for the quantities as the dependent variables. Except for the PPML estimations for List 3, all coefficient estimates are positive and statistically significant.

The service sector industries are included in the non-treatment group in the above analyses. As the Trump tariffs are imposed on manufactured goods, including service sector industries in the non-treatment group may be inappropriate. Although excluding the service sector industries reduces the number of sectors in the non-treatment group to only three, as shown in Table 15, the same equation is estimated. Table 16 presents the results. The coefficient estimates for $TrumpListEffectiveDummy_{jt}$ are positive and statistically significant, except for the PPML estimations for List 3. Table 17 presents the estimation results for quantities. They are very similar, except for the PPML estimation for List 3, which has a negative sign.

Maintaining an adequate number of industries for the non-treatment group requires a more disaggregated input–output table. Whereas China's most disaggregated input–output table is the one used in the above analyses with 153 industries (100 manufacturing sector industries), Japan's input–output table has 496 industries, of which 326 belong to the manufacturing sector. The higher number of manufacturing industries allows for an appropriate number of non-treatment groups. A disadvantage of using Japan's input–output table is that China's input–output structure must be assumed to be the same as Japan's, which may be too strong an assumption. However, by 2015, for which the most recent Japanese input–output table is available, the Chinese and Japanese economies had developed similarly. Assuming the same input–output structure may thus be innocuous; alternatively, the pros of such an assumption may outweigh the cons. As shown in Table 18, 38 industries are non-Trump targeted industries out of 326 industries when using the Japanese input-output table. The estimation results for the values and quantities are shown in Tables 19 and 20, respectively. All coefficient estimates for $TrumpListEffectiveDummy_{jt}$ are positive and highly statistically significant.

Overall, these estimation results show that exports from upstream industries in Japan increased for Trump-targeted (downstream) industries, contrary to a priori expectations. This intriguing result could have occurred because China increased its exports of Trump-tariff goods

to other countries, more than offsetting the decreased exports to the U.S.² I have investigated this point below.

4.4. *China's exports to the world*

To analyze whether China increased its exports of Trump-list goods to other trade partner countries, which more than offset the decrease in its exports to the U.S., I use China's export data at tariff lines, aggregated at the HS six-digit level for consistency with the Trump tariffs. Figure 5 shows China's export values to the U.S. and the world (ROW). The export values to the U.S. register a substantial decrease, whereas those to the rest of the world, despite dropping in one month, show a slight increase in general.

To formally analyze the issue, I estimate the following equation.

$$\ln \text{ExpVal}_{igt} = \beta_0 + \beta_1 \text{TrumpListEffectiveDummy}_{gt} + \alpha_{ig} + \alpha_{gt} + \alpha_{it} + \varepsilon_{igt}, \quad (5)$$

where $\ln \text{ExpVal}_{igt}$ is the log of China's export value of good g to country i at time t (months/year). $\text{TrumpListEffectiveDummy}_{gt}$ takes a value of 1 if an export good g is Trump tariff-listed and time t is after the effective date (practically, months) of the Trump tariffs. Table 21 presents the estimation results. The coefficient estimates for $\text{TrumpListEffectiveDummy}_{igt}$ are positive and statistically significant.

I also estimate the same equation for export quantities.

$$\ln \text{ExpQty}_{igt} = \beta_0 + \beta_1 \text{TrumpListEffectiveDummy}_{gt} + \alpha_{ig} + \alpha_{gt} + \alpha_{it} + \varepsilon_{igt}, \quad (6)$$

where $\ln \text{ExpQty}_{igt}$ is the logarithm of China's export quantity of good g to country i at time t (months/year). The definitions of the other covariates are the same as those in Equation (5). Table 22 shows the estimation results. $\text{TrumpListEffectiveDummy}_{gt}$ shows statistically significant positive signs for non-zero trade, but statistically significant negative signs for the PPML cases, including zero trade. Some negative coefficients are not surprising because these estimations include the U.S. Tables 23 and 24 show the estimation results for China's export values and quantities to countries other than the U.S., respectively. The coefficient estimates are mostly positive and statistically significant.

Overall, China increased its export values and quantities of Trump-targeted goods to the world, offsetting the decrease in its exports to the U.S.

² Ideally, it should be investigated whether there was an increase in *production* of Trump-targeted goods, rather than exports. However, monthly production data for China are unavailable. Instead, China's export data has been used.

5. CONCLUDING REMARKS AND DISCUSSION

Using monthly trade data from the U.S., Japan, and China, this study investigates the effects of Trump's trade war with China on Japan's trade. Overall, there is little change in Japan's import values/quantities of Trump-targeted goods from China. However, considering the time lag for the reaction, there are some signs of an increase in the extensive margins (a change in trade values from zero to positive numbers of newly traded goods). Import prices appear to have decreased, that is, Japan seems to have enjoyed a terms of trade effect because of Trump's trade war with China. Contrary to prior expectations, Japanese industries that were the upstream suppliers of China's (downstream) industries subjected to the Trump tariffs increased their exports to China. A plausible reason for these unexpected results is that China increased exports of Trump tariff-targeted goods to the world. Specifically, China more than offset the negative impact of the Trump tariffs on its exports to the U.S. by increasing its exports to other countries. However, the reason Chinese firms could increase their exports of Trump-targeted goods to the world is yet to be investigated.

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Figures and Tables

Figure 1: Japan's imports of Trump's targeted and non-targeted goods from China

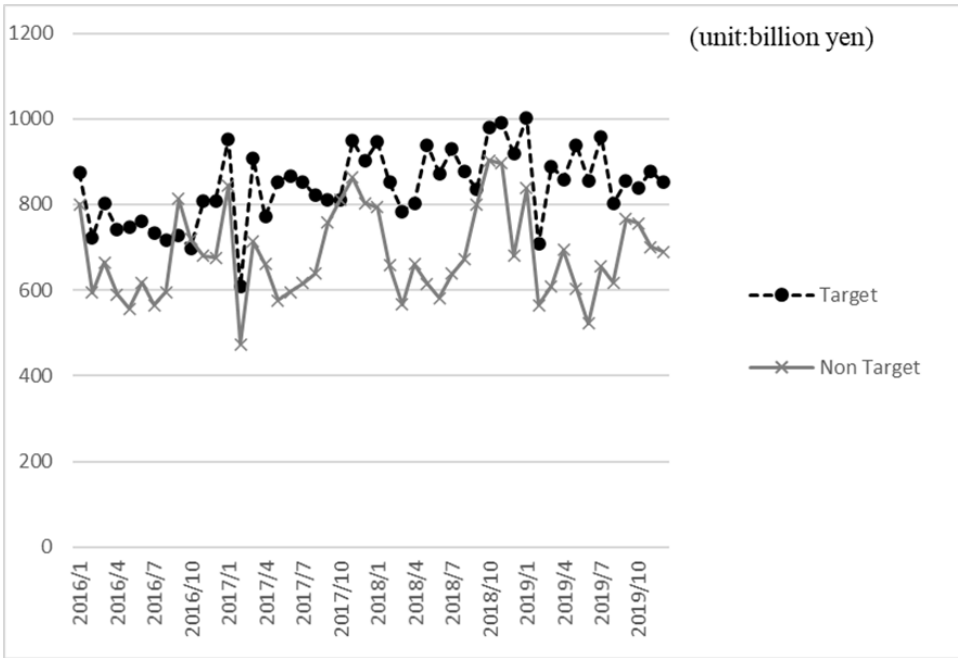


Figure 2: Japan's import values of Trump's targeted goods (List 1)

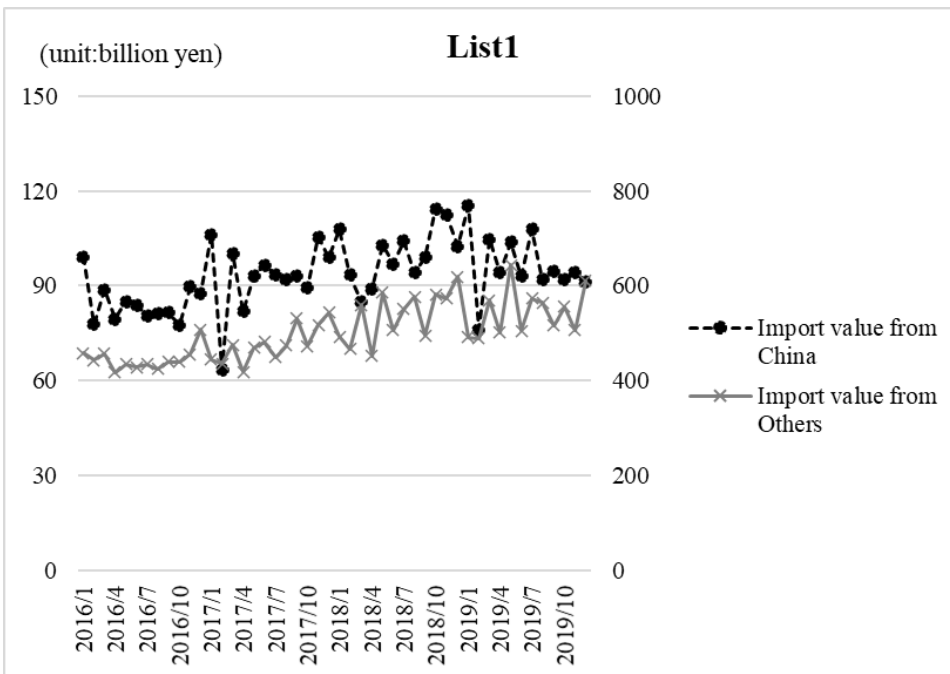


Figure 3: Japan's import values of Trump's targeted goods (List 2)

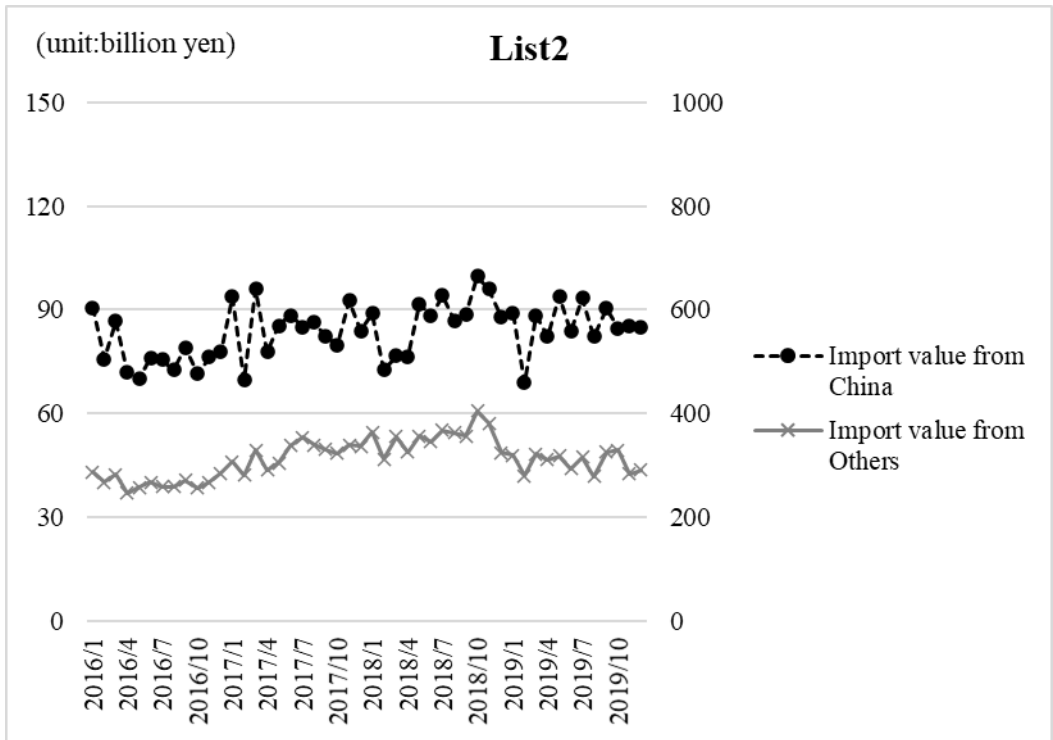


Figure 4: Japan's import values of Trump's targeted goods (List 3)

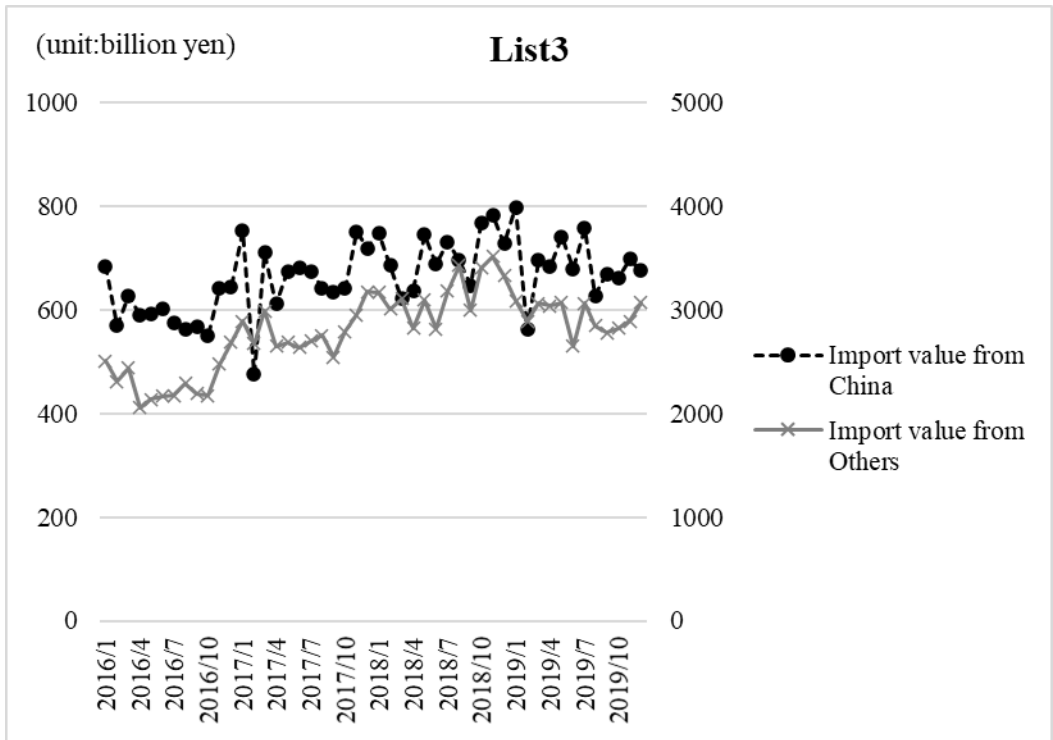
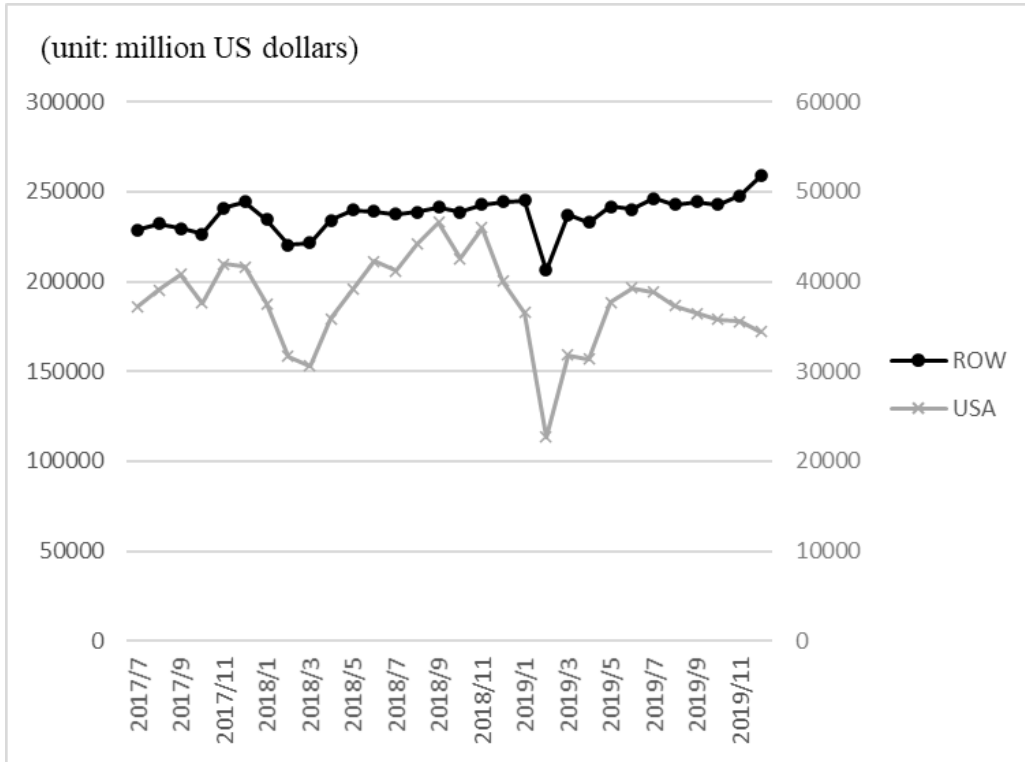


Figure 5: China's export values of Trump's targeted goods to the U.S. and the rest of the world (ROW)



Source: Authors' computation from monthly trade data of China

Table 1: Summary of the Trump tariffs on imports from China

	List 1	List 2	List 3
Date of the executive orders being effective	6th Jun., 2018	23rd Jul., 2018	1st: 24th Sep., 2018 2nd: 10th May., 2019
The purpose of the trade act	China's laws, politics, practices, or actions may be unreasonable or discriminatory and may be harming American intellectual property (IP) rights, innovation, or technology development.		
Relevant US domestic law	Section 301 of the Trade Act of 1974		
The number of targeted items*	818	279	5745
Ad valorem duties	25%	25%	1st: 10% 2nd: 25%
The characteristics of targeted items*	High value-added products (Industrial equipments)	Industrial products e.g, plastics, semiconductors, and railway parts	Consumer products e.g, home appliances, chemical products, and textile products

Note *: Targeted goods are defined at HS 8-digit. The total number of HS 8-digit goods is 11300.

Source: Author's elaboration from Office of the United States Trade Representative (USTR)'s official announcement. See the reference for the URL.

Table 2: Estimation results for the effects of the Trump tariff on Japan's import values from China

Dependent variable:		List1	List2	List3
Log of Japan import values				
Trump list effective dummy		-0.009 (0.02)	0.009 (0.03)	0.011 (0.01)
Fixed effects:	Time-Country	Yes	Yes	Yes
	Time-Goods	Yes	Yes	Yes
	Country-Goods	Yes	Yes	Yes
Adjusted R-squared		0.874	0.873	0.872
Number of observations		463,011	465,411	462,184

Robust standard errors in parentheses

note: + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3: Estimation results for the effects of the Trump tariff on Japan's import values from China (considering the time lag)

Dependent variable:		List1	List2	List3
Log of Japan import values				
Trump list effective dummy		0.026 (0.02)	0.048 (0.03)	-0.013 (0.01)
Fixed effects:	Time-Country	Yes	Yes	Yes
	Time-Goods	Yes	Yes	Yes
	Country-Goods	Yes	Yes	Yes
Adjusted R-squared		0.898	0.898	0.898
Number of observations		581,279	583,429	584,547

Robust standard errors in parentheses

note: + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4: Poisson pseudo maximum likelihood estimation results for the effects of the Trump tariff on Japan's import values from China (zero trade included)

Dependent variable:		List1	List2	List3
Japan import values				
Trump list effective dummy		-0.018 (0.02)	-0.009 (0.03)	0.006 (0.02)
Fixed effects:	Time-Country	Yes	Yes	Yes
	Time-Goods	Yes	Yes	Yes
	Country-Goods	Yes	Yes	Yes
Pseudo R-squared		0.983	0.983	0.983
Number of observations		1,042,232	1,042,232	1,034,159

Robust standard errors in parentheses

note: + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5: Poisson pseudo maximum likelihood estimation results for the effects of the Trump tariff on Japan's import values from China (considering the time lag; zero trade included)

Dependent variable:		List1	List2	List3
Japan import values				
Trump list effective dummy		-0.004 (0.02)	0.051* (0.03)	0.034* (0.02)
Fixed effects:	Time-Country	Yes	Yes	Yes
	Time-Goods	Yes	Yes	Yes
	Country-Goods	Yes	Yes	Yes
Pseudo R-squared		0.982	0.982	0.982
Number of observations		1,362,421	1,372,364	1,365,715

Robust standard errors in parentheses
note: + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Dependent variable:		List1	List2	List3
Log of Japan import quantities				
Trump list effective dummy		-0.003 (0.03)	0.040 (0.04)	0.024 (0.02)
Fixed effects:	Time-Country	Yes	Yes	Yes
	Time-Goods	Yes	Yes	Yes
	Country-Goods	Yes	Yes	Yes
Adjusted R-squared		0.928	0.927	0.927
Number of observations		457,804	460,126	456,929

Robust standard errors in parentheses
note: + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7: Estimation results for the effects of the Trump tariff on Japan's import quantities from China (considering the time lag)

Dependent variable:		List1	List2	List3
Log of Japan import quantities				
Trump list effective dummy		0.004 (0.03)	0.087** (0.04)	0.009 (0.02)
Fixed effects:	Time-Country	Yes	Yes	Yes
	Time-Goods	Yes	Yes	Yes
	Country-Goods	Yes	Yes	Yes
Adjusted R-squared		0.925	0.925	0.925
Number of observations		574,675	576,801	577,891

Robust standard errors in parentheses

note: + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 8: Poisson pseudo maximum likelihood estimation results for the effects of the Trump tariff on Japan's import quantities from China (zero trade included)

Dependent variable:		List1	List2	List3
Japan import quantities				
Trump list effective dummy		-0.207*** (0.07)	0.082 (0.07)	0.029 (0.06)
Fixed effects:	Time-Country	Yes	Yes	Yes
	Time-Goods	Yes	Yes	Yes
	Country-Goods	Yes	Yes	Yes
Pseudo R-squared		0.994	0.994	0.994
Number of observations		1,028,951	1,028,951	1,021,876

Robust standard errors in parentheses

note: + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 9: Poisson pseudo maximum likelihood estimation results for the effects of the Trump tariff on Japan’s import quantities from China (considering the time lag; zero trade included)

Dependent variable:		List1	List2	List3
Japan import quantities				
Trump list effective dummy		-0.202*** (0.07)	0.045 (0.08)	-0.001 (0.07)
Fixed effects:	Time-Country	Yes	Yes	Yes
	Time-Goods	Yes	Yes	Yes
	Country-Goods	Yes	Yes	Yes
Pseudo R-squared		0.994	0.993	0.993
Number of observations		1,345,631	1,353,897	1,347,494

Robust standard errors in parentheses

note: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 10: Estimation results for the effects of the Trump tariff on Japan's import unit values from China

Dependent variable:		List1	List2	List3
Log of Japan import unit value				
Trump list effective dummy		-0.007 (0.02)	-0.030 (0.02)	-0.014 (0.01)
Fixed effects:	Time-Country	Yes	Yes	Yes
	Time-Goods	Yes	Yes	Yes
	Country-Goods	Yes	Yes	Yes
Adjusted R-squared		0.935	0.935	0.935
Number of observations		457,804	460,126	456,929

Robust standard errors in parentheses

note: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 11: Estimation results for the effects of the Trump tariff on Japan's import unit values from China (considering the time lag)

Dependent variable:		List1	List2	List3
Log of Japan import unit value				
Trump list effective dummy		0.023 (0.02)	-0.033* (0.02)	-0.022** (0.01)
Fixed effects:	Time-Country	Yes	Yes	Yes
	Time-Goods	Yes	Yes	Yes
	Country-Goods	Yes	Yes	Yes
Adjusted R-squared		0.932	0.932	0.932
Number of observations		574,675	576,801	577,891

Robust standard errors in parentheses

note: + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 12: The number of industries subjected to the Trump tariffs

	List1	List2	List3
Total number of industries	145	145	145
Non target industry	113	117	57
Trump target industry	32	28	88

Note: Chinese IO table has 153 industries.

Through HS-CPC-China IO industry code concordance we constructed, the 153 industries were concorded to the 145 industries, out of which 53 belong to service sector.

Table 13: Estimation results for Japan's export values of upstream Trump-listed goods

Dependent variable: Log of Japan export values to China		List1			
	12 month	15 month	12 month zero	15 month zero	
Trump list effective dummy	1.061*** (0.03)	1.065*** (0.03)	0.948*** (0.09)	0.946*** (0.09)	
Fixed effects: Time-Goods	Yes	Yes	Yes	Yes	
Ajusted R-squared	0.527	0.520	-	-	
Pseudo R-squared	-	-	0.370	0.400	
Number of observations	61,471	76,626	92,840	115,808	

Dependent variable: Log of Japan export values to China		List2			
	12 month	15 month	12 month zero	15 month zero	
Trump list effective dummy	1.135*** (0.03)	1.137*** (0.03)	1.005*** (0.10)	0.996*** (0.10)	
Fixed effects: Time-Goods	Yes	Yes	Yes	Yes	
Ajusted R-squared	0.512	0.506	-	-	
Pseudo R-squared	-	-	0.399	0.393	
Number of observations	58,353	72,951	88,452	110,376	

Dependent variable: Log of Japan export values to China		List3			
	12 month	15 month	12 month zero	15 month zero	
Trump list effective dummy	0.436*** (0.03)	0.441*** (0.03)	0.269*** (0.08)	0.251*** (0.08)	
Fixed effects: Time-Goods	Yes	Yes	Yes	Yes	
Ajusted R-squared	0.497	0.494	-	-	
Pseudo R-squared	-	-	0.328	0.326	
Number of observations	103,491	129,597	147,168	189,216	

Robust standard errors in parentheses

note: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 14: Estimation results for Japan's export quantities of upstream Trump-listed goods

Dependent variable:		List1			
Log of Japan export quantities to					
China	12 month	15 month	12 month zero	15 month zero	
Trump list effective dummy	1.126*** (0.04)	1.133*** (0.04)	0.433*** (0.13)	0.437*** (0.13)	
Fixed effects: Time-Goods	Yes	Yes	Yes	Yes	
Ajusted R-squared	0.603	0.597	-	-	
Pseudo R-squared	-	-	0.370	0.400	
Number of observations	61,129	76,284	89,408	111,672	

Dependent variable:		List2			
Log of Japan export quantities to					
China	12 month	15 month	12 month zero	15 month zero	
Trump list effective dummy	1.214*** (0.04)	1.214*** (0.04)	0.496*** (0.13)	0.504*** (0.13)	
Fixed effects: Time-Goods	Yes	Yes	Yes	Yes	
Ajusted R-squared	0.592	0.586	-	-	
Pseudo R-squared	-	-	0.399	0.393	
Number of observations	58,099	72,635	85,260	110,376	

Dependent variable:		List3			
Log of Japan export quantities to					
China	12 month	15 month	12 month zero	15 month zero	
Trump list effective dummy	0.503*** (0.03)	0.504*** (0.03)	-0.169 (0.12)	-0.204* (0.12)	
Fixed effects: Time-Goods	Yes	Yes	Yes	Yes	
Ajusted R-squared	0.586	0.584	-	-	
Pseudo R-squared	-	-	0.328	0.326	
Number of observations	103,081	129,019	147,168	182,592	

Robust standard errors in parentheses

note: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 15: The number of industries subjected to the Trump tariffs: China’s input–output table (Manufacturing sector industry only)

	List1	List2	List3
Total number of industries	92	92	92
Non target industry	3	3	3
Trump target industry	32	28	88

Note: Chinese IO table has 153 industries.

Through HS-CPC-China IO industry code concordance we constructed, the 153 industries were concorded to the 145 industries, out of which 53 belong to service sector.

Table 16: Estimation results for Japan’s export values of upstream Trump-listed goods (manufacturing sector industries only)

Dependent variable:		List1			
Log of Japan export values to China		12 months	15 months	12 months_zero	15 months_zero
Trump list effective dummy		1.223*** (0.09)	1.235*** (0.09)	0.841*** (0.22)	0.839*** (0.22)
Fixed effects: Time-Goods		Yes	Yes	Yes	Yes
Adjusted R-squared		0.718	0.713	-	-
Pseudo R-squared		-	-	0.469	0.468
Number of observations		26,581	33,106	34,965	43,540

Dependent variable:		List2			
Log of Japan export values to China		12 months	15 months	12 months_zero	15 months_zero
Trump list effective dummy		1.263*** (0.09)	1.263*** (0.09)	0.894*** (0.22)	0.891*** (0.22)
Fixed effects: Time-Goods		Yes	Yes	Yes	Yes
Adjusted R-squared		0.691	0.686	-	-
Pseudo R-squared		-	-	0.466	0.465
Number of observations		23,587	29,479	31,372	39,184

Dependent variable:		List3			
Log of Japan export values to China		12 months	15 months	12 months_zero	15 months_zero
Trump list effective dummy		0.554*** (0.08)	0.546*** (0.08)	0.162 (0.21)	0.132 (0.21)
Fixed effects: Time-Goods		Yes	Yes	Yes	Yes
Adjusted R-squared		0.566	0.564	-	-
Pseudo R-squared		-	-	0.349	0.347
Number of observations		68,819	86,189	91,910	115,024

Robust standard errors in parentheses

note: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 17: Estimation results for Japan’s export quantities of upstream Trump-listed goods (manufacturing sector industries only)

Dependent variable: Log of Japan export quantities to		List1			
China		12 months	15 months	12 months zero	15 months zero
Trump list effective dummy		1.217*** (0.10)	1.227*** (0.10)	0.433*** (0.13)	0.437*** (0.13)
Fixed effects: Time-Goods		Yes	Yes	Yes	Yes
Adjusted R-squared		0.761	0.758	-	-
Pseudo R-squared		-	-	0.617	0.615
Number of observations		26,331	32,856	89,408	111,672

Dependent variable: Log of Japan export quantities to		List2			
China		12 months	15 months	12 months zero	15 months zero
Trump list effective dummy		1.272*** (0.10)	1.272*** (0.10)	0.496*** (0.13)	0.504*** (0.13)
Fixed effects: Time-Goods		Yes	Yes	Yes	Yes
Adjusted R-squared		0.741	0.737	-	-
Pseudo R-squared		-	-	0.613	0.613
Number of observations		23,406	29,254	85,260	106,512

Dependent variable: Log of Japan export quantities to		List3			
China		12 months	15 months	12 months zero	15 months zero
Trump list effective dummy		0.548*** (0.09)	0.539*** (0.09)	-0.169 (0.12)	-0.204* (0.12)
Fixed effects: Time-Goods		Yes	Yes	Yes	Yes
Adjusted R-squared		0.644	0.642	-	-
Pseudo R-squared		-	-	0.549	0.550
Number of observations		68,473	85,702	146,016	182,592

Robust standard errors in parentheses
note: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 18: The number of industries subjected to the Trump tariffs: Japan's input–output table (Manufacturing sector industry only)

	List1	List2	List3
Total number of industries	326	326	326
Non target industry	38	38	38
Trump target industry	61	50	270

Note: Japanese IO table has 496 industries.

Through HS-Japan IO industry code concordance Ministry of Internal Affairs and Communication constructed, the Japan IO table has the 326 manufacturing industries, out of which 170 belong to service sector.

Table 19: Estimation results for Japan's export values of upstream Trump-listed goods (manufacturing sector industries only) using Japan's input–output table

Dependent variable: Log of Japan export values to China		List1			
	12 months	15 months	12 months zero	15 months zero	
Trump list effective dummy	0.800*** (0.03)	0.790*** (0.03)	0.774*** (0.13)	0.776*** (0.12)	
Fixed effects: Time-Goods	Yes	Yes	Yes	Yes	
Adjusted R-squared	0.616	0.615	-	-	
Pseudo R-squared	-	-	0.534	0.534	
Number of observations	80,907	101,397	82,988	104,001	

Dependent variable: Log of Japan export values to China		List2			
	12 months	15 months	12 months zero	15 months zero	
Trump list effective dummy	1.087*** (0.03)	1.081*** (0.03)	0.959*** (0.09)	0.958*** (0.09)	
Fixed effects: Time-Goods	Yes	Yes	Yes	Yes	
Adjusted R-squared	0.591	0.590	-	-	
Pseudo R-squared	-	-	0.551	0.548	
Number of observations	59,413	74,314	61,283	76,654	

Dependent variable: Log of Japan export values to China		List3			
	12 months	15 months	12 months zero	15 months zero	
Trump list effective dummy	0.444*** (0.03)	0.442*** (0.03)	0.440*** (0.09)	0.411*** (0.09)	
Fixed effects: Time-Goods	Yes	Yes	Yes	Yes	
Adjusted R-squared	0.545	0.546	-	-	
Pseudo R-squared	-	-	0.473	0.472	
Number of observations	189,092	236,427	194,458	243,130	

Robust standard errors in parentheses

note: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 20: Estimation results for Japan's export quantities of upstream Trump-listed goods (manufacturing sector industries only) using Japan's input–output table

Dependent variable:		List1			
Log of Japan export quantities to					
China		12 months	15 months	12 months zero	15 months zero
Trump list effective dummy		0.800***	0.790***	0.616***	0.635***
		(0.03)	(0.03)	(0.16)	(0.16)
Fixed effects: Time-Goods		Yes	Yes	Yes	Yes
Adjusted R-squared		0.709	0.714	-	-
Pseudo R-squared		-	-	0.692	0.691
Number of observations		80,881	101,363	82,962	103,967

Dependent variable:		List2			
Log of Japan export quantities to					
China		12 months	15 months	12 months zero	15 months zero
Trump list effective dummy		1.087***	1.083***	0.946***	0.965***
		(0.03)	(0.03)	(0.17)	(0.17)
Fixed effects: Time-Goods		Yes	Yes	Yes	Yes
Adjusted R-squared		0.705	0.704	-	-
Pseudo R-squared		-	-	0.691	0.692
Number of observations		59,376	74,221	61,245	76,559

Dependent variable:		List3			
Log of Japan export quantities to					
China		12 months	15 months	12 months zero	15 months zero
Trump list effective dummy		0.445***	0.442***	0.585***	0.582***
		(0.03)	(0.03)	(0.15)	(0.15)
Fixed effects: Time-Goods		Yes	Yes	Yes	Yes
Adjusted R-squared		0.693	0.690	-	-
Pseudo R-squared		-	-	0.686	0.687
Number of observations		188,815	235,973	194,177	242,668

Robust standard errors in parentheses

note: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 21: Estimation results for China's export values to the world

Dependent variable: Log of China's export value		List1			
		12month	15month	12month_zero	15month_zero
Trump list effective dummy		0.022*** (0.01)	0.063*** (0.01)	-0.083*** (0.02)	-0.011 (0.01)
Fixed effects:	Time	Yes	Yes	Yes	Yes
	Goods	Yes	Yes	Yes	Yes
	Time-Country	Yes	Yes	Yes	Yes
	Country-Goods	Yes	Yes	Yes	Yes
Adjusted R-squared		0.824	0.814	-	-
Pseudo R-squared		-	-	0.961	0.959
Number of observations		1,240,805	1,554,720	1,772,712	2,268,645

Dependent variable: Log of China's export value		List2			
		12month	15month	12month_zero	15month_zero
Trump list effective dummy		0.011 (0.01)	0.062*** (0.01)	-0.002 (0.02)	0.090*** (0.02)
Fixed effects:	Time	Yes	Yes	Yes	Yes
	Goods	Yes	Yes	Yes	Yes
	Time-Country	Yes	Yes	Yes	Yes
	Country-Goods	Yes	Yes	Yes	Yes
Adjusted R-squared		0.821	0.813	-	-
Pseudo R-squared		-	-	0.960	0.959
Number of observations		1,236,758	1,564,260	1,768,212	2,276,070

Dependent variable: Log of China's export value		List3			
		12month	15month	12month_zero	15month_zero
Trump list effective dummy		0.043*** (0.00)	0.026*** (0.01)	0.030*** (0.02)	-0.005 (0.01)
Fixed effects:	Time	Yes	Yes	Yes	Yes
	Goods	Yes	Yes	Yes	Yes
	Time-Country	Yes	Yes	Yes	Yes
	Country-Goods	Yes	Yes	Yes	Yes
Adjusted R-squared		0.821	0.815	-	-
Pseudo R-squared		-	-	0.961	0.960
Number of observations		1,249,031	1,574,074	1,780,944	2,282,970

Robust standard errors in parentheses

note: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 22: Estimation results for China's export quantities to the world

Dependent variable: Log of China's export quantities		List1			
		12 months	15 months	12 months_zero	15 months_zero
Trump list effective dummy		0.028*** (0.01)	0.065*** (0.01)	0.003 (0.02)	-0.093 (0.0736)
Fixed effects:	Time	Yes	Yes	Yes	Yes
	Goods	Yes	Yes	Yes	Yes
	Time-Country	Yes	Yes	Yes	Yes
	Country-Goods	Yes	Yes	Yes	Yes
Adjusted R-squared		0.893	0.887	-	-
Pseudo R-squared		-	-	0.971	0.952
Number of observations		1,240,805	1,554,720	1,767,300	2,260,920

Dependent variable: Log of China's export quantities		List2			
		12 months	15 months	12 months_zero	15 months_zero
Trump list effective dummy		0.027*** (0.01)	0.083*** (0.01)	-0.094 (0.06)	-0.124* (0.07)
Fixed effects:	Time	Yes	Yes	Yes	Yes
	Goods	Yes	Yes	Yes	Yes
	Time-Country	Yes	Yes	Yes	Yes
	Country-Goods	Yes	Yes	Yes	Yes
Adjusted R-squared		0.891	0.886	-	-
Pseudo R-squared		-	-	0.953	0.952
Number of observations		1,236,758	1,564,260	1,762,212	2,267,250

Dependent variable: Log of China's export quantities		List3			
		12 months	15 months	12 months_zero	15 months_zero
Trump list effective dummy		0.038*** (0.00)	0.014*** (0.00)	-0.172** (0.08)	-0.187** (0.09)
Fixed effects:	Time	Yes	Yes	Yes	Yes
	Goods	Yes	Yes	Yes	Yes
	Time-Country	Yes	Yes	Yes	Yes
	Country-Goods	Yes	Yes	Yes	Yes
Adjusted R-squared		0.891	0.887	-	-
Pseudo R-squared		-	-	0.953	0.951
Number of observations		1,249,031	1,574,074	1,774,764	2,274,390

Robust standard errors in parentheses

note: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 23: Estimation results for China's export values to the world, excluding the U.S.

Dependent variable: Log of China's export values		List1			
		12 months	15 months	12 months_zero	15 months_zero
Trump list effective dummy		0.028*** (0.01)	0.065*** (0.01)	-0.056*** (0.02)	0.006 (0.01)
Fixed effects:	Time	Yes	Yes	Yes	Yes
	Goods	Yes	Yes	Yes	Yes
	Time-Country	Yes	Yes	Yes	Yes
	Country-Goods	Yes	Yes	Yes	Yes
Adjusted R-squared		0.816	0.806	-	-
Pseudo R-squared		-	-	0.948	0.945
Number of observations		1,178,605	1,477,013	1,694,712	2,170,050

Dependent variable: Log of China's export values		List2			
		12 months	15 months	12 months_zero	15 months_zero
Trump list effective dummy		0.023** (0.01)	0.074*** (0.01)	0.027 (0.03)	0.119*** (0.02)
Fixed effects:	Time	Yes	Yes	Yes	Yes
	Goods	Yes	Yes	Yes	Yes
	Time-Country	Yes	Yes	Yes	Yes
	Country-Goods	Yes	Yes	Yes	Yes
Adjusted R-squared		0.813	0.806	-	-
Pseudo R-squared		-	-	0.947	0.945
Number of observations		1,174,801	1,486,489	1,690,452	2,177,625

Dependent variable: Log of China's export values		List3			
		12 months	15 months	12 months_zero	15 months_zero
Trump list effective dummy		0.047*** (0.00)	0.034*** (0.00)	0.037*** (0.01)	0.040*** (0.01)
Fixed effects:	Time	Yes	Yes	Yes	Yes
	Goods	Yes	Yes	Yes	Yes
	Time-Country	Yes	Yes	Yes	Yes
	Country-Goods	Yes	Yes	Yes	Yes
Adjusted R-squared		0.814	0.808	-	-
Pseudo R-squared		-	-	0.947	0.946
Number of observations		1,186,770	1,496,094	1,703,148	2,184,585

Robust standard errors in parentheses

note: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 24: Estimation results for China's exports quantities to the world, excluding the U.S.

Dependent variable: Log of China's export quantities		List1			
		12 months	15 months	12 months_zero	15 months_zero
Trump list effective dummy		0.033*** (0.01)	0.062*** (0.01)	0.029 (0.02)	-0.005 (0.05)
Fixed effects:	Time	Yes	Yes	Yes	Yes
	Goods	Yes	Yes	Yes	Yes
	Time-Country	Yes	Yes	Yes	Yes
	Country-Goods	Yes	Yes	Yes	Yes
Adjusted R-squared		0.891	0.884	-	-
Pseudo R-squared		-	-	0.969	0.962
Number of observations		1,174,093	1,470,954	1,689,504	2,162,625

Dependent variable: Log of China's export quantities		List2			
		12 months	15 months	12 months_zero	15 months_zero
Trump list effective dummy		0.045*** (0.01)	0.099*** (0.01)	-0.020 (0.05)	-0.055 (0.06)
Fixed effects:	Time	Yes	Yes	Yes	Yes
	Goods	Yes	Yes	Yes	Yes
	Time-Country	Yes	Yes	Yes	Yes
	Country-Goods	Yes	Yes	Yes	Yes
Adjusted R-squared		0.889	0.884	-	-
Pseudo R-squared		-	-	0.964	0.961
Number of observations		1,169,938	1,479,853	1,684,728	2,169,135

Dependent variable: Log of China's export quantities		List3			
		12 months	15 months	12 months_zero	15 months_zero
Trump list effective dummy		0.044*** (0.00)	0.025*** (0.00)	-0.035 (0.03)	-0.036 (0.04)
Fixed effects:	Time	Yes	Yes	Yes	Yes
	Goods	Yes	Yes	Yes	Yes
	Time-Country	Yes	Yes	Yes	Yes
	Country-Goods	Yes	Yes	Yes	Yes
Adjusted R-squared		0.889	0.885	-	-
Pseudo R-squared		-	-	0.965	0.960
Number of observations		1,181,799	1,489,321	1,697,244	2,176,335

Robust standard errors in parentheses

note: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Appendix

Figure A1: Illustration of the application of the proportionality assumption

Chinese Input- Output table in 2018	Industries of Chinese exports to US (downstream)					Unit: million dollars
	1	2	3	...	i	Export values (row total)
1						
Industries of Japanese exports to China (upstream)		Dependent variables				
2		12 (60%)	6 (30%)	2 (10%)		20
3						
...						
j						

Suppose that the proportions of Industry 2's (upstream industry) product sales to Industries 1, 2, and 3 (downstream industries) are 60%, 30%, and 10%, respectively, in the Chinese domestic input–output table. The same proportions are then applied to Japan's exports to China. Specifically, 60% of Industry 2's imports (upstream) from Japan to China are assumed to be used as intermediate inputs in China's (downstream) Industry 1, 30% in (downstream) Industry 2, and 10% in (downstream) Industry 3. Only the total export values of Industry 2, from Japan to China, are known. In this example, 20 million dollars are divided into 12, 6, and 2 million dollars using the abovementioned proportions. I use these numbers in the estimation analyses.