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Trump Tariffs and Roundabout Trade**Tadashi ITO**^{#§}*Gakushuin University, Tokyo, Japan*

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Abstract: *Although there are many news articles about tariff dodging by re-routing made-in-China goods through third countries and relabelling them as made-in-Mexico or made-in-Viet Nam, there are no scientific studies on the issue. This paper provides statistical evidence on whether such practices are taking place. Using monthly trade statistics at the most disaggregated level, analysis using data up to 2019, the year before the COVID-19 shock, show little evidence of roundabout trade. With an extended data set up to 2023, overall, there is little sign of roundabout trade, although some slight signs of roundabout trade for Mexico and Viet Nam.*

Keywords: Trump tariffs, Roundabout trade

JEL Classification: F14

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1. Introduction

It is without doubt that one of the largest unexpected shocks in international trade in the past 20–30 years was the launch of a trade war against China by former United States (US) President Donald Trump. Many academic papers have shown that Trump’s tariffs substantially reduced Chinese exports to the US. On the other hand, some reports suggest that artful dodging of Trump tariffs took place. One of the ways is through roundabout trade, or detour trade.¹ When goods are exported to final destination countries via third countries to circumvent export embargos on the destination countries or to avoid high import tariffs imposed by the final destination countries, such exports are called roundabout trade or detour trade. Many news articles² suggested that Chinese goods navigated alternate trade routes to the US, namely, exporters used third countries to bypass the Trump tariffs. However, these news articles are short of hard evidence supported by robust scientific analysis. This study will investigate the issue through scientific methods. This paper aims to investigate whether or not roundabout trade is prevalent, i.e. if there are general signs of roundabout trade for many countries, rather than looking at particular cases of roundabout trade. To this end, this study uses monthly trade data at the highly disaggregated product level, which are available for many countries for the appropriate period to investigate the issue. Admittedly, to precisely identify roundabout trade, firm-level export/import data are needed, but these data are available only under strict conditions of use and only for some selected countries, which are usually unavailable for recent years.

As shown in Table 1, Trump’s tariffs against China covered a wide range of products. More than 60% of HS 8-digit product lines were targeted by the Trump administration with a substantial import duty rate of 25%. Thus, Trump’s tariffs’ effects on US-China trade and the subsequent impact on world trade have been a hot subject investigated by many trade economists for the past few years. Many academic papers show a substantial decrease in Chinese exports of Trump-targeted goods to the US. Some studies show that several other US partner countries increased their exports to the US at the expense of China. On the other hand, some studies suggest that China seems to have increased its exports to other countries even more than it reduced its exports to the US. Namely, it seems that China in fact expanded its exports of Trump-targeted goods to the world (Ito, 2022a). One potential explanation is that

¹ This paper uses the terms ‘roundabout trade’ and ‘detour trade’ interchangeably with the same meaning.

² See for example, <https://asia.nikkei.com/Spotlight/Datawatch/Chinese-goods-navigate-alternate-trade-routes-to-US-shores> or <https://edition.cnn.com/2022/12/02/politics/china-solar-tariff-investigation-climate/index.html>

China may have genuinely increased its exports to third countries through the Chinese government's policy changes, such as the export VAT refund. Another potential explanation is tariff dodging as mentioned above. This study investigates tariff dodging through roundabout trade as it has caught much attention from the media and the public.

Table 1: Overview of Trump Tariffs

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

* Targeted goods are defined at the HS 8-digit level. The total number of HS 8-digit goods is 11,300. Source: Author's elaboration from the USTR's official announcement.

Literature

The previous studies on Trump's tariffs, although not necessarily exhaustive, showed the following findings. Using difference-in-difference estimations, Amiti, Redding, and Weinstein (2019), and Amiti, Redding, and Weinstein (2020) showed the substantially negative effects of Trump tariffs on Chinese exports to the US. More specifically, US tariffs are almost entirely borne by US firms and consumers (no terms of trade effect). The substantial redirection of trade in response to the 2018 tariffs took place. A 10% tariff is associated with about a 10% drop in imports for the first three months, but this elasticity doubles in magnitude in subsequent months. Amiti, Redding, and Weinstein (2019) showed that the cumulative deadweight welfare cost (reduction in real income) from the US tariffs was around \$8.2 billion

in 2018. Applying event study estimation, Fajgelbaum et al. (2020) showed that the US import values of Trump-listed goods from targeted countries decreased by 31.7%, whereas the US total import values for Trump-listed goods, irrespective of the import partner countries (no matter whether the import partners were subject to Trump tariffs or not) decreased by 2.5%. US firms and consumers who bought Trump-listed imported goods suffered US\$51 trillion in real income, equivalent to 0.27% of US gross domestic product (GDP). The sum of this loss for US firms and consumers plus the increase in consumer surplus (due to a slight decrease in the border price) and tariff revenue, resulted in a loss of US\$7.2 trillion, equivalent to 0.04% of US GDP. Studying the tariff pass-through at the levels of the US retailers and consumers, Cavallo et al. (2021) also showed similar findings to the above studies, most notably, the complete pass-through of the Trump tariffs to the US domestic price. For the case of consumer goods, such as washing machines, handbags, and refrigerators, they found that the tariff burden fell completely on retailers, not consumers, as they found that the retail price of these goods did not change.

Trump's tariffs against China had impacts on third countries. Chor and Li (2021), using satellite readings of night-time luminosity, showed that locations within China that were more exposed to the US tariffs experienced a larger decrease in night light intensity, pointing to a contraction in local economic activity. Cui and Li (2021) showed that the US import tariff hikes were associated with relative reductions in Chinese new firm entry rates. He, Mau, and Xu (2021) found that firms that were relatively more exposed to US tariffs in 2019 responded by posting fewer job advertisements in the six months following the tariff increase. The reduction amounted to 2.4%–3.2% fewer advertisements on average per firm. Other authors investigated the ripple effects of Trump's trade war against China through global value chains. For example, using information at the tariff-line level on sanctions and retaliations, and encapsulating this information in a general equilibrium framework featuring imperfect competition, recursive dynamics, and global value chains (MIRAGE-e V2), Bellora and Fontagné (2020) found that, consistent with political economy determinants, these twists of value added were transmitted to production factors, leading to sizeable creation and destruction of jobs and the reallocation of capital to the benefit of protected sectors, mostly at the expense of their clients. On the effects on Japanese firms' activities, Sun et al. (2019), using information on Japanese multinationals' activities in China, showed that Chinese affiliates, especially those with high exposure to trade with North America, in general saw a decline in sales since the trade war began. Ito (2022a) found that Trump's tariffs against China

substantially decreased US imports from China, whereas many US import partner countries increased their exports to the US at the expense of China, in a kind of trade diversion effect. The study also found that whilst there was no sign of a decrease in border prices of US imports from China (no terms of trade improvement), US imports from other partner countries of Trump-listed goods (targeting China) showed a decrease in their border price. Ito (2022b) showed that there was no increase in Japan's import values/quantities of Trump-targeted goods from China, but the import price slightly decreased. Surprisingly and contrary to a priori expectation, it was also found that Japanese industries that are linked as upstream industries of China's (downstream) industries subjected to Trump's tariffs increased their exports to China. To investigate the reason for this unexpected result, the study analysed China's exports of the Trump tariff-targeted goods to the world and found that China increased its exports of those goods to the world. Namely, an increase in China's exports to countries other than the US more than offset the decrease in its exports to the US. On the other hand, somewhat contrary to Ito's (2022b) finding, Hayakawa et al. (2022) argued that the decrease in China's output exports to the US caused by the Trump tariffs reduced China's input imports from supplier economies, especially from Taiwan.

Tariff dodging by trade through third countries could be a reason for the above-mentioned seemingly increasing exports of Trump-tariff goods from China to countries other than the US. This study investigates whether there is evidence of such roundabout trade using large and detailed trade statistics. Given the lack of firm-level export and import data for many countries that could be involved in roundabout trade, this study attempts to investigate the issue by using export and import data at the most detailed product level.

2. Data and Methodologies

2.1. Definition of Roundabout Trade

As mentioned in the introduction section, when goods are exported to final destination countries via third countries to circumvent export embargos on the destination countries or to avoid high import tariffs imposed by the final destination countries, such exports are called roundabout trade or detour trade. There could be many ways that roundabout trade is done. For example, a Chinese firm sets up its affiliate (foreign direct investment) in, say, Viet Nam and imports goods from the headquarters in China and re-exports to the US. Or, a firm in a bypass country, say, Viet Nam, imports goods from China and re-exports them to the US. In this case, the Vietnamese firm in the middle is the one that engages in roundabout trade. The Chinese firm that exported the goods to the Vietnamese firm is unaware of the re-exporting from Viet Nam. When goods are exported through third countries that have free trade agreements (FTAs) with the US, such as Canada or Mexico, FTA tariff rates may or may not be utilised. When US importers apply for FTA tariff rates, they need to show the rules of origin certificate. However, legitimately relabeling ‘made in China’ to ‘made in Mexico’ and thus making the goods eligible for FTA tariffs incurs a relatively high cost because Mexican firms in the middle need to do some processing of the products. On the other hand, the benefits gained by the use of FTA rates are relatively small because the gap between the most favoured nation (MFN) rates and FTA rates is not substantial, usually only a few percent, such as an MFN rate of 3% and an FTA rate of 0. As the Trump tariffs were mostly 25%, the benefit gained by roundabout trade changed little between MFN imports and FTA imports. Given this cost-benefit perspective, many firms did not probably have much incentive to apply for the use of FTA rates. As mentioned in the introduction section, with the trade data only, it is impossible to precisely identify roundabout trade. Instead, this paper aims to deduce whether there are general signs of roundabout trade by studying the unusually rapid increase of imports from China and simultaneously rapid increase of exports to the US of Trump tariff goods compared with non-Trump tariff goods.

2.2. Data Source

To investigate the issue, we use monthly trade data at the Harmonised System (HS) 6-digit level taken from the Global Trade Atlas. Given an extremely large sample size, which reaches tens of millions of observations, we focus on the major trade partner countries of the US and China that may have engaged in roundabout trade. More specifically we first obtain the yearly export and import data at the HS 6-digit level for the 20 countries that are the top US import partner countries and also the top Chinese export partner countries. The countries are, in alphabetical order, Belgium, Brazil, Canada, France, Germany, India, Indonesia, Italy, Japan, Malaysia, Mexico, Netherlands, Philippines, the Republic of Korea (henceforth, Korea), Russia, Singapore, Spain, Thailand, the United Kingdom, and Viet Nam. Then, by making graphs of these countries' imports from China and exports to the US, we choose seven countries (Canada, India, Malaysia, Mexico, the Philippines, Korea, and Viet Nam) as potential bypass routes for Trump-targeted goods. We obtain the monthly trade data of these seven countries from the Global Trade Atlas.

The list of Trump-targeted goods is taken from the Office of the United States Trade Representative (USTR)'s official announcement. As Table 1 shows, more than half of products are targeted by Trump tariffs.

2.3. Methodology

As mentioned in section 2.1, the unusually rapid increase in imports from China and the simultaneous rapid increase in exports to the US of Trump tariff goods compared with non-Trump tariff goods is a sign of roundabout trade. The following is the estimation equation we employ to identify whether roundabout trade took place:

$$\begin{aligned} \ln Exp_{ymjp} = & \beta_0 + \beta_1 \ln Imp_{ymi p} + \beta_2 \ln Imp_{ymi p} * RoundaboutDummy + \alpha_{ymi j} + \alpha_{yijp} \\ & + \alpha_{mijp} + \varepsilon_{ymi j p} \end{aligned}$$

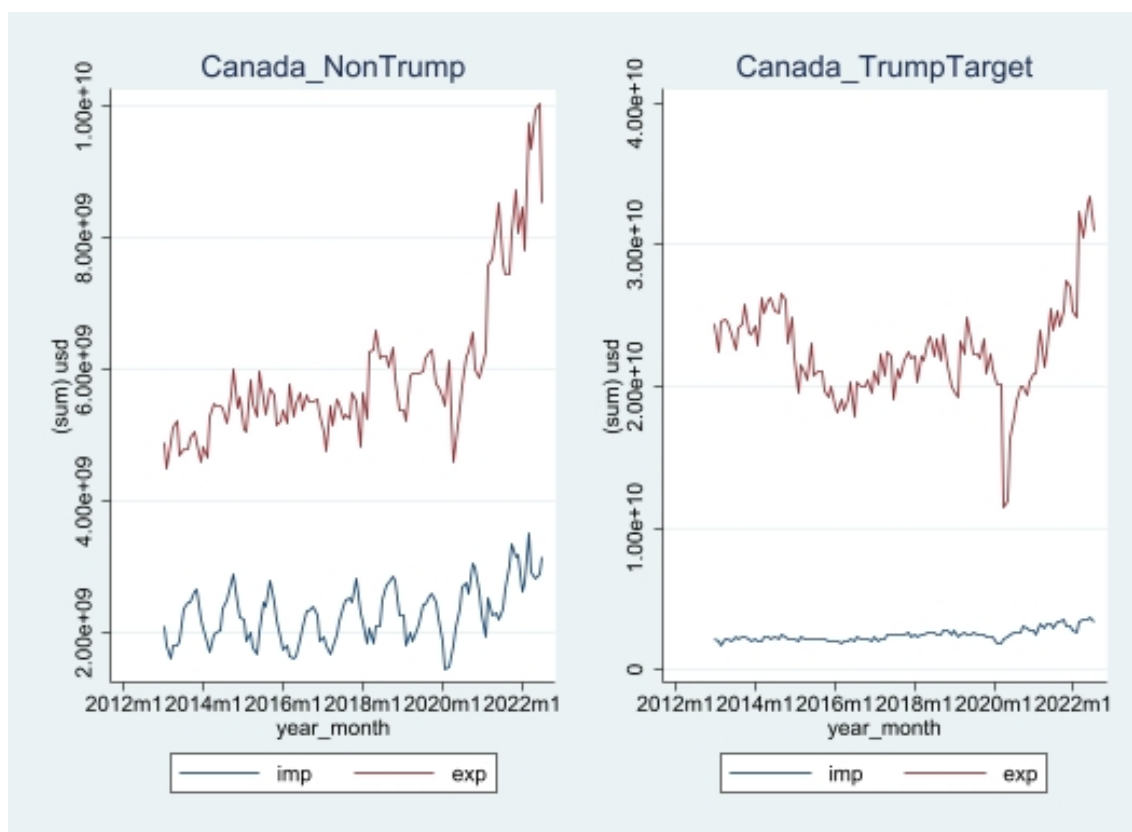
where y , m , i , j , and p represent the year, month, import partner, export partner, and product, respectively. Note that we estimate the equation by each reporter country, such as Mexico, Canada, or Viet Nam, to see if the reporter country in question seems to have engaged in roundabout trade of the Trump-targeted goods. The covariate, $\ln Imp_{ymi p}$, captures the association between the import values of the reporter country (e.g. Malaysia) of good p from country i to its export values of the same good p . The expected sign is positive because when the production of good (or industry) p in the reporter country (e.g. Malaysia) is expanded, the expansion brings about both imports of intermediate goods and exports of processed goods

classified in the same category p . *RoundaboutDummy* takes a value of 1 if imports are from China ($i=China$) and exports are to the US ($j=US$) and p are Trump targeted goods. Thus, the cross-term $\ln Imp_{ymip} * RoundaboutDummy$ picks up the roundabout trade. α is the fixed effects. We include full fixed effects to correctly identify the roundabout trade. We estimate the equation with full fixed effects as above for the period January 2016–June 2019, which sufficiently covers before and after the Trump tariff shock. Out of the selected countries mentioned above, we especially focus on Canada, Mexico, and Asian countries. Canada and Mexico were chosen because they are both United States-Mexico-Canada Agreement countries and have no import duties, and, thus, are potential stopover places for roundabout trade. Asian countries are also potential stopover places because of their proximity to China and the large and regular export flows to the US. To ease understanding of the identification strategy of the above estimation equation, a sketch of this identification strategy is shown in Figure A1 and a sketch of the data structure is shown in Figure A2 in the appendix. To further address potential endogeneity, estimations using the lagged explanatory variables have been done.

3. Descriptive Analyses

Figure 1 shows Canada’s imports from China and exports to the US of non-Trump-targeted goods (the left panel) and Trump-targeted goods (the right panel). If roundabout trade had been taking place through Canada, the import values from China and the export values to the US of the Trump-targeted goods should have both picked up from around August–November 2018, when the Trump tariffs kicked in. Meanwhile, the export and import values of non-Trump-targeted goods should not have increased as much as the Trump-targeted goods. A casual observation of the figures suggests that there seems to be no roundabout trade through Canada.

Figure 1: Canada’s Imports from China and Exports to the US of Non-Trump-targeted Goods and Trump-targeted Goods

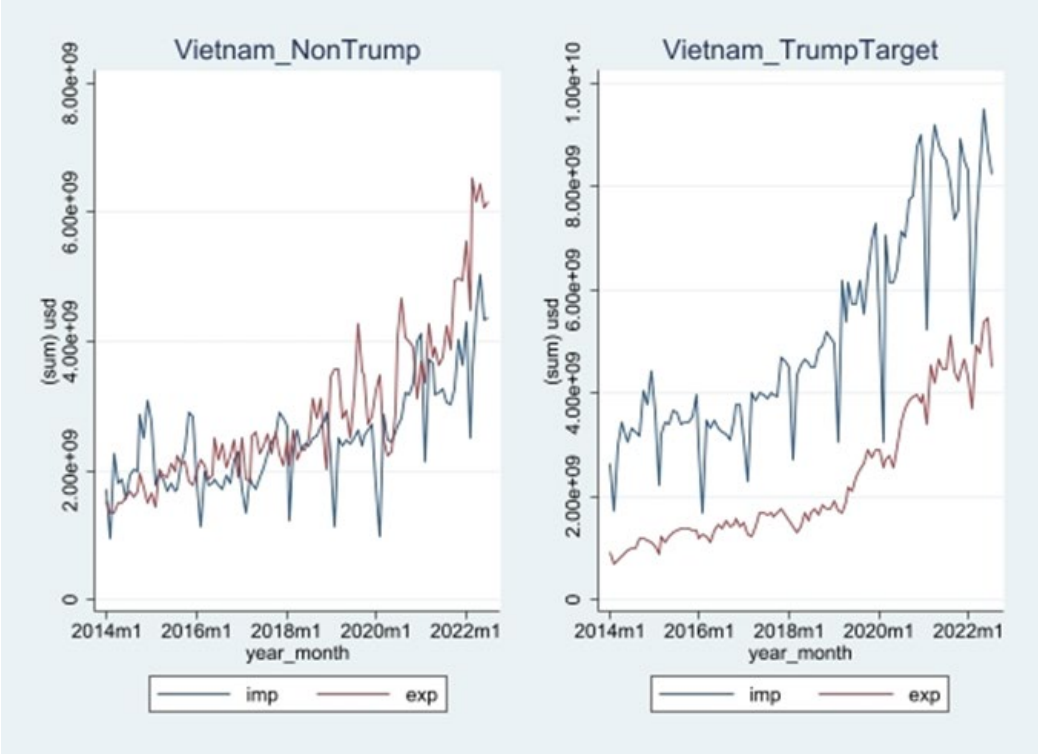


Source: Author’s elaboration from the trade data.

Figure 2 is the case for Viet Nam. The imports from China and the exports to the US both steadily increased over the sample period. However, it is not clear if the increase is larger for Trump-targeted goods than non-Trump-targeted goods. Figure 3 is the case for Malaysia. Trump-targeted goods may seem to have increased both imports from China and exports to the US compared to non-Trump-targeted goods, but it is not clear. We have drawn the figures for all the countries in question and have not found a clear sign of roundabout trade.³

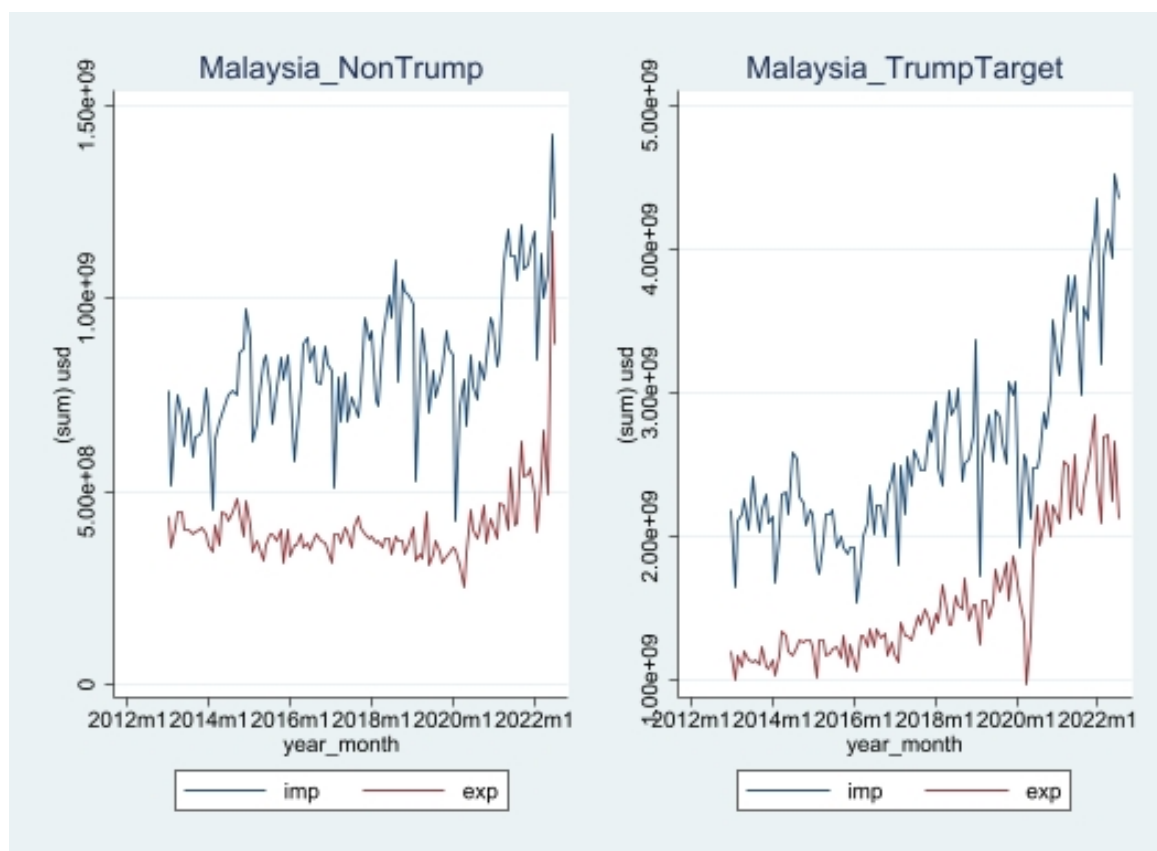
³ Because of the space limit of this project proposal, the figures for the other countries are not shown here but are available on request.

Figure 2: Viet Nam’s Imports from China and Exports to the US of Non-Trump-targeted Goods and Trump-targeted Goods



Source: Author’s elaboration from the trade data.

Figure 3: Malaysia’s Imports from China and Exports to the US of Non-Trump-targeted Goods and Trump-targeted Goods



Source: Author’s elaboration from the trade data.

To see in which kinds of products dubious cases of roundabout trade are taking place, I have extracted products that meet three criteria. The first criterion is that both imports from China and exports to the US increased by more than or equal to US\$1 million to abstract away minor (small trade value) goods trade. The second criterion is that the gap between increases in the export value to the US and the import value from China is within 20% because the increased import amount from China should more or less match the increased export amount to the US if such trade is roundabout trade. The third criterion is that both imports and exports increased by more than twice because both imports from China and exports to the US should have increased substantially if the increased trade is roundabout trade. An explanation using numerical examples is in the appendix. Table 2 shows the number of HS 6-digit codes that meet the three criteria within the corresponding HS 2-digit codes.⁴ Table 3 shows the

⁴ The case of relaxing the third criterion to a 50% increase is in the appendix (Table A1.).

description of each HS 2-digit code. By country, the numbers of Canada, India, and Korea are relatively large. By produce code, ‘84: Machinery and mechanical appliances, boilers, nuclear reactors; parts thereof’ and ‘85: Electrical machinery and equipment and parts thereof’, are relatively large.

Table 2: Dubious Cases of Roundabout Trade

hs2	reporter							
	Canada	India	Malaysia	Mexico	Philippines	Korea	Viet Nam	Total
	No.	No.	No.	No.	No.	No.	No.	No.
3	1	0	0	0	0	1	0	2
20	0	0	0	0	0	1	0	1
25	1	0	0	0	0	0	0	1
28	1	2	0	0	0	0	0	3
29	1	2	0	0	0	1	0	4
33	0	0	0	0	0	0	1	1
34	0	0	1	0	0	0	0	1
37	0	0	0	0	0	0	0	0
38	0	0	1	0	0	0	0	1
39	1	1	1	0	0	3	1	7
40	1	3	1	0	0	0	0	5
42	0	0	0	0	0	0	0	0
44	0	1	2	0	1	0	0	4
48	1	1	1	1	0	0	0	4
56	0	0	0	1	0	1	0	2
60	1	0	0	0	0	0	0	1
68	0	0	0	1	0	1	0	2
69	1	0	0	0	0	0	0	1
70	0	2	0	0	0	0	0	2
73	0	0	0	0	0	0	0	0
74	0	2	0	0	0	1	0	3
75	0	0	0	0	0	0	0	0
82	0	0	0	0	0	1	0	1
83	0	0	0	0	0	0	0	0
84	4	5	1	1	1	3	1	16
85	1	3	3	0	0	2	2	11
86	0	1	0	0	0	0	0	1
87	0	0	0	0	1	0	0	1
90	0	0	0	1	2	0	1	4
94	0	1	0	0	0	0	0	1
Total	14	24	11	5	5	15	6	80

Source: Author’s elaboration from the trade data.

Table 3: Dubious Cases of Roundabout Trade, HS 2-digit Code Description

Code	Description	Total number of HS 6-digit codes	Number of HS 6-digit codes meeting the 3 criteria	Percentage
03	Fish and crustaceans, molluscs and other aquatic invertebrates	224	2	0.9%
20	Preparations of vegetables, fruit, nuts or other parts of plants	52	1	1.9%
25	Salt; sulphur; earths, stone; plastering materials, lime and cement	68	1	1.5%
28	Inorganic chemicals; organic and inorganic compounds of precious metals; of rare earth metals, of radio-active elements and of isotopes	174	3	1.7%
29	Organic chemicals	385	4	1.0%
33	Essential oils and resinoids; perfumery, cosmetic or toilet preparations	29	1	3.4%
34	Soap, organic surface-active agents; washing, lubricating, polishing or scouring preparations; artificial or prepared waxes, candles and similar articles, modelling pastes, dental waxes and dental preparations with a basis of plaster	23	1	4.3%
37	Photographic or cinematographic goods	30	0	0.0%
38	Chemical products n.e.c.	92	1	1.1%
39	Plastics and articles thereof	129	7	5.4%
40	Rubber and articles thereof	80	5	6.3%
42	Articles of leather; saddlery and harness; travel goods, handbags and similar containers; articles of animal gut (other than silk-worm gut)	20	0	0.0%
44	Wood and articles of wood; wood charcoal	103	4	3.9%
48	Paper and paperboard; articles of paper pulp, of paper or paperboard	101	4	4.0%
56	Wadding, felt and nonwovens, special yarns; twine, cordage, ropes and cables and articles thereof	30	2	6.7%
60	Fabrics; knitted or crocheted	44	1	2.3%
68	Stone, plaster, cement, asbestos, mica or similar materials; articles thereof	49	2	4.1%
69	Ceramic products	30	1	3.3%
70	Glass and glassware	64	2	3.1%
73	Iron or steel articles	124	0	0.0%
74	Copper and articles thereof	50	3	6.0%
75	Nickel and articles thereof	17	0	0.0%
82	Tools, implements, cutlery, spoons and forks, of base metal; parts thereof, of base metal	64	1	1.6%
83	Metal; miscellaneous products of base metal	36	0	0.0%
84	Machinery and mechanical appliances, boilers, nuclear reactors; parts thereof	516	16	3.1%
85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers; television image and sound recorders and reproducers, parts and accessories of such articles	265	11	4.2%
86	Railway, tramway locomotives, rolling-stock and parts thereof; railway or tramway track fixtures and fittings and parts thereof; mechanical (including electro-mechanical) traffic signalling equipment of all kinds	23	1	4.3%
87	Vehicles; other than railway or tramway rolling stock, and parts and accessories thereof	87	1	1.1%
90	Optical, photographic, cinematographic, measuring, checking, medical or surgical instruments and apparatus; parts and accessories	144	4	2.8%
94	Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; lamps and lighting fittings, n.e.c.; illuminated signs, illuminated name-plates and the like; prefabricated buildings	42	1	2.4%

Source: Author's elaboration from the trade data.

4. Estimation Analyses

The estimation results of the above equation are shown in Table 4. Because it takes a long time for the estimations as mentioned above owing to the extremely large numbers of fixed effects, we limit the period to January 2016–December 2019, which still sufficiently covers the pre- and post-Trump tariff periods. We also use only the top 30 import and export partners for the reporter country in question, i.e. (1) Canada, (2) India, and so on. If roundabout trade has taken place, the variables of interest, detour (roundabout), should show statistically significant coefficients with positive signs. The estimation results show statistically insignificant coefficient estimates. There is no clear evidence of roundabout trade.

As there may be some time lags in roundabout trade, i.e. goods are imported from China and then exported to the US, we estimate the same equation but with a one-month lagged detour (roundabout). The results are shown in Table 5, with qualitatively similar results to Table 4.

Table 4: Estimation Results on Roundabout Trade

VARIABLES	(1) Canada	(2) Indonesia	(3) Malaysia	(4) Mexico	(5) Singapore	(6) Korea	(7) Thailand	(8) Viet Nam	(9) India	(10) Philippines
ln_imp_val	0.000809* (0.000403)	0.000237 (0.000530)	0.00342*** (0.000455)	0.00166*** (0.000407)	0.00475*** (0.000302)	0.000630* (0.000294)	0.000859** (0.000321)	-0.000113 (0.000364)	0.000736* (0.000362)	-0.000917 (0.000999)
roundabout (detour)	0.000870 (0.00136)	0.00332 (0.00525)	-0.00165 (0.00331)	0.00216 (0.00213)	0.00306 (0.00405)	-0.00105 (0.00258)	-0.000285 (0.00363)	0.00555 (0.00459)	0.00256 (0.00286)	-0.0162* (0.00750)
Month*Importer dummy*Exporter dummy*Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year*Importer dummy*Exporter dummy*Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
year*month*Importer dummy*Exporter dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	14,439,626	7,585,136	9,261,981	13,933,028	18,528,624	17,320,517	20,968,602	12,959,211	16,224,897	2,389,201
R-squared	0.887	0.879	0.903	0.897	0.892	0.899	0.890	0.900	0.855	0.871

Robust standard errors in parentheses

*** p<0.001, **p<0.01, *p<0.05

Source: Author's estimation using the trade data.

Table 5: Estimation Results on Roundabout Trade, Lagged Explanatory Variables

VARIABLES	(1) Canada	(2) Indonesia	(3) Malaysia	(4) Mexico	(5) Singapore	(6) Korea	(7) Thailand	(8) Viet Nam	(9) India	(10) Philippines
ln_imp_val_l1	0.000402 (0.000473)	-0.00115 (0.000617)	0.00212*** (0.000531)	0.00189*** (0.000467)	0.00324*** (0.000345)	0.000750* (0.000338)	0.00110** (0.000364)	0.000106 (0.000422)	0.00188*** (0.000430)	-0.00109 (0.00120)
roundabout (detour)	0.000693 (0.00132)	0.00365 (0.00509)	-0.00123 (0.00324)	0.00244 (0.00198)	0.000333 (0.00399)	-0.00131 (0.00242)	0.000186 (0.00347)	0.00324 (0.00485)	0.000378 (0.00272)	-0.0152* (0.00746)
Month*Importer dummy*Exporter dummy*Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year*Importer dummy*Exporter dummy*Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
year*month*Importer dummy*Exporter dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	10,242,462	5,187,435	6,468,080	10,286,497	13,792,895	13,009,570	15,555,337	9,340,382	11,385,893	1,526,537
R-squared	0.897	0.889	0.911	0.910	0.902	0.906	0.900	0.908	0.865	0.882

Robust standard errors in parentheses

*** p<0.001, **p<0.01, *p<0.05

Source: Author's estimation using the trade data.

5. Extended Period

The above analysis intentionally constrained the period of analysis to January 2016–December 2019 to avoid contamination by the effect of COVID-19 and to lessen the burden of computations. However, as we have the data available for the post-COVID-19 period, this section provides the same estimation analyses including the most recently available data, namely from January 2016 to August/September 2023.⁵ In 2020, the Trump administration further added more products to the Trump tariffs. The Biden administration did not lift the Trump tariffs, but there were some changes to the list. Table 6 shows the outline of Trump tariffs for the extended period.

Table 6: Overview of Trump Tariffs, Extended Period

	List 1	List 2	List 3	List 4
Date of the executive orders being effective	6 June 2018	23 July 2018	1 st : 24 September 2018 2 nd : 10 May 2019	1 September 2019
The purpose of the trade act	China's laws, politics, practices or actions maybe unreasonable or discriminatory and maybe harming American intellectual property (IP) rights, innovation, or technology development			
Relevant U.S. domestic law	Section 301 of the Trade Act of 1974			
The number of targeted items*	818	279	5745	3805
Ad volarem duties	25%	25%	1 st : 10% 2 nd : 25%	25%
The total number of exempted items**	266	76	476	109
The ratio of exempted items to target items	33%	27%	8%	3%
The date of the first exemption	28 December 2018	31 July 2019	28 October 2019	10 March 2020
The number of exemption	12	7	18	10

⁵ Some countries report the trade statistics up to August 2023, but other countries report up to September 2023.

	List 1	List 2	List 3	List 4
phases				
The characteristics of targeted items*	High value-added products (industrial equipments)	Industrial products e.g. (plastics, semiconductors, railway parts)	Consumer products e.g. (home appliances, chemical products, textile products)	Consumer products e.g. mobile phone, laptop, toy, and video game

* Targeted goods are defined at the HS 8-digit level. The total number of HS 8-digit goods is 11,300.

** Author's counting of the exempted items at the HS 8-digit level. The USTR defines exempted items at the HS 10-digit level.

Source: Author's elaboration from the USTR's official announcement.

The estimation results for the extended period are in Table 7. With the extended period, there are some signs of roundabout trade for Mexico and Viet Nam, indicating that, as time goes by, traders learn how to dodge Trump tariffs.

The estimation results with the lagged dependent variable are in Table 8. Mexico shows some signs of roundabout trade but no such signs for the other countries.

Table 7: Estimation Results on Roundabout Trade, Extended Period of January 2016–August/September 2023

VARIABLES	(1) Canada	(2) Indonesia	(3) Malaysia	(4) Mexico	(5) Singapore	(6) Korea	(7) Thailand	(8) Viet Nam	(9) India	(10) Philippines
In_imp_val	0.00203*** (0.000258)	0.000816* (0.000327)	0.00459*** (0.000295)	0.00207*** (0.000264)	0.00593*** (0.000196)	0.00110*** (0.000192)	0.00223*** (0.000207)	0.00150*** (0.000225)	0.00237*** (0.000228)	-0.000346 (0.000596)
roundabout (detour)	-6.41e-05 (0.000669)	-0.00184 (0.00253)	-0.000688 (0.00171)	0.00315** (0.00107)	0.000220 (0.00204)	-0.000502 (0.00127)	0.00218 (0.00180)	0.00593** (0.00222)	0.000618 (0.00144)	-0.00652 (0.00339)
Month*Importer dummy*Exporter dummy*Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year*Importer dummy*Exporter dummy*Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
year*month*Importer dummy*Exporter dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	29,733,641	17,111,492	20,113,226	28,466,069	38,308,678	36,835,355	42,851,383	29,603,811	34,885,217	5,436,975
R-squared	0.866	0.859	0.884	0.877	0.872	0.881	0.870	0.883	0.831	0.857

Robust standard errors in parentheses

*** p<0.001. **p<0.01, *p<0.05

Source: Author's estimation using the trade data.

Table 8: Estimation Results on Roundabout Trade, Lagged Explanatory Variables, Lagged Explanatory Variables, Extended Period of January 2016–August/September 2023

VARIABLES	(1) Canada	(2) Indonesia	(3) Malaysia	(4) Mexico	(5) Singapore	(6) Korea	(7) Thailand	(8) Viet Nam	(9) India	(10) Philippines
In_imp_val_l1	0.00121*** (0.000305)	0.000160 (0.000377)	0.00269*** (0.000343)	0.00175*** (0.000305)	0.00425*** (0.000223)	0.000988*** (0.000220)	0.00213*** (0.000234)	0.000801** (0.000260)	0.00234*** (0.000269)	0.000963 (0.000707)
roundabout (detour)	-0.000513 (0.000643)	-0.00210 (0.00246)	-0.00225 (0.00169)	0.00302** (0.000987)	0.00136 (0.00199)	0.00135 (0.00120)	0.00304 (0.00172)	0.00417 (0.00236)	-0.000606 (0.00135)	-0.00636 (0.00337)
Month*Importer dummy*Exporter dummy*Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year*Importer dummy*Exporter dummy*Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
year*month*Importer dummy*Exporter dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	20,921,748	11,750,770	13,918,666	20,954,094	28,573,562	27,763,360	31,700,846	21,521,132	24,581,119	3,483,215
R-squared	0.877	0.869	0.892	0.891	0.883	0.888	0.881	0.892	0.842	0.869

Robust standard errors in parentheses

*** p<0.001. **p<0.01, *p<0.05

Source: Author's estimation using the trade data.

6. Another Estimation Model as a Robustness Check

As a robustness check, I estimate the following estimation equation. In this equation, I exclude imports from the explanatory variables.

$$\ln Exp_{ymjp} = \beta_0 + \beta_1 * RoundaboutDummy + \alpha_{ymij} + \alpha_{yijp} + \alpha_{mijp} + \varepsilon_{ymijp}$$

The estimation results are shown in Table 9. As in the case of the above estimation analyses, Viet Nam shows some signs of roundabout trade.

7. Estimation for the Dubious Product Categories

I estimate the same model for the dubious product categories shown in Table 2. The estimation results are shown in Table 10. There are no signs of roundabout trade.

8. Conclusion

Although there are many news articles about tariff dodging by re-routing made-in-China goods through third countries and relabelling them as made-in-Mexico or made-in-Viet Nam, there are no scientific studies on the issue. This paper provides hard evidence on whether such practices are taking place. The analyses of the data up to 2019, the year before the COVID-19 shock, show little evidence of roundabout trade. With the extended data set up to 2023, overall, there is little sign of roundabout trade, there are some slight signs of roundabout trade for Mexico and Viet Nam. The policy relevance of this study is substantial because the Trump tariffs are one of the largest shocks of the past 20–30 years in international trade and, thus, had a large impact on the world economy. Out of the many impacts of the Trump tariffs, tariff dodging is one of the important issues that we need to clarify.

Table 9: Estimation Results on Roundabout Trade, Extended Period of January 2016–August/September 2023, Excluding Import Values from the Explanatory Variables

VARIABLES	(1) Canada	(2) Indonesia	(3) Malaysia	(4) Mexico	(5) Singapore	(6) Korea	(7) Thailand	(8) Viet Nam	(9) India	(10) Philippines
roundabout (detour)	-0.000964 (0.00962)	-0.0326 (0.0347)	-0.0273 (0.0242)	0.0201 (0.0154)	0.00639 (0.0282)	-0.00707 (0.0187)	0.0233 (0.0252)	0.0740* (0.0300)	-0.0141 (0.0197)	-0.0950* (0.0449)
Month*Importer dummy*Exporter dummy*Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year*Importer dummy*Exporter dummy*Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
year*month*Importer dummy*Exporter dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	29,733,641	17,111,492	20,113,226	28,466,069	38,308,678	36,835,355	42,851,383	29,603,811	34,885,217	5,436,975
R-squared	0.866	0.859	0.884	0.877	0.872	0.881	0.870	0.883	0.831	0.857

Robust standard errors in parentheses

*** p<0.001. **p<0.01, *p<0.05

Source: Author's estimation using the trade data

Table 10: Estimation Results on Roundabout Trade, January 2016–August/September 2023, for the Dubious Product Categories

VARIABLES	(1) Canada	(2) Indonesia	(3) Malaysia	(4) Mexico	(5) Singapore	(6) Korea	(7) Thailand	(8) Viet Nam	(9) India	(10) Philippines
ln_imp_val	0.000402 (0.000694)	0.00136 (0.00271)	0.00419*** (0.000698)	-0.00406 (0.00313)	0.00362*** (0.000831)	0.000386 (0.000530)	0.00232*** (0.000571)	0.00131* (0.000572)	0.000648 (0.000603)	-0.000616 (0.00239)
detour	-0.00110 (0.00176)	0.0540 (0.0318)	0.00158 (0.00332)	0.00106 (0.0121)	-0.0161 (0.0118)	-0.00125 (0.00340)	0.00915 (0.00487)	0.00685 (0.00482)	-0.00560 (0.00401)	0.0224 (0.0130)
Month*Importer dummy*Exporter dummy*Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year*Importer dummy*Exporter dummy*Product dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
year*month*Importer dummy*Exporter dummy fixed effect	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	4,974,631	305,491	3,612,156	274,647	1,999,790	5,122,192	5,377,603	4,605,108	5,221,874	414,326
R-squared	0.828	0.857	0.909	0.916	0.882	0.855	0.865	0.897	0.805	0.859

Robust standard errors in parentheses

*** p<0.001. **p<0.01, *p<0.05

Source: Author's estimation using the trade data

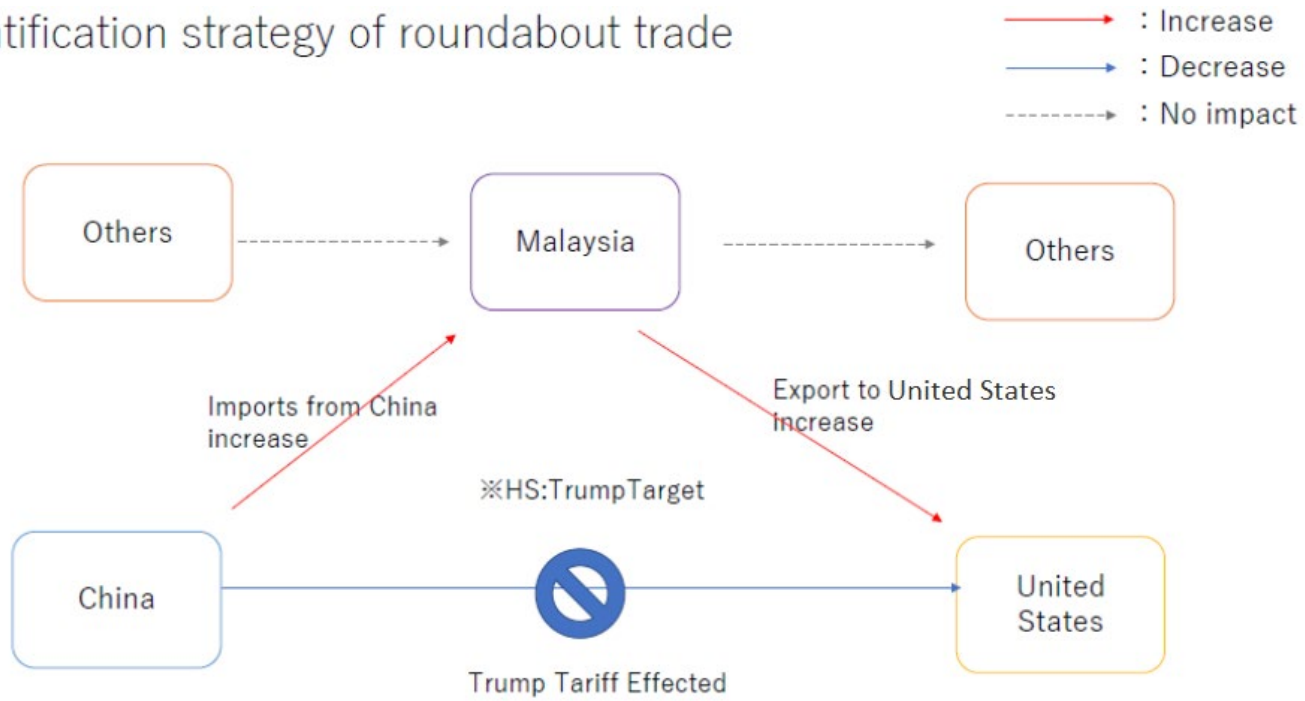
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Appendix

Figure A1: A Sketch of the Identification Strategy

Identification strategy of roundabout trade



Source: Author.

Figure A2. Data Structure

Estimation equation

$$\ln Exp_{ymijp} = \beta_0 + \beta_1 \ln Imp_{ymip} + \beta_2 \ln Imp_{ymip} * RoundaboutDummy + \alpha_{ymij} + \alpha_{yijp} + \alpha_{mijp} + \varepsilon_{ymijp}$$

year	month	reporter	HS	TrumpTariff	TrumpEffective	import_partner	imp_val	export_partner	expval	ExpUSA_ImpCHN_dummy	Roundabout dummy
2016	1	MYS	111111	0	0	CHN	10	USA	10	1	0
2016	1	MYS	111111	0	0	JPN	20	USA	10	0	0
2016	1	MYS	111111	0	0	CHN	10	CHN	30	0	0
2016	1	MYS	111111	0	0	CHN	10	CAN	20	0	0
2016	1	MYS	111111	0	0	JPN	20	CAN	20	0	0
2016	1	MYS	111111	0	0	JPN	20	JPN	10	1	0
2016	1	MYS	111112	1	0	CHN	10	USA	10	1	0
2016	1	MYS	111112	1	0	JPN	20	USA	10	0	0
2016	1	MYS	111112	1	0	CHN	10	CHN	40	0	0
2016	1	MYS	111112	1	0	CHN	10	CAN	20	0	0
2016	1	MYS	111112	1	0	JPN	20	CAN	20	0	0
2016	1	MYS	111112	1	0	JPN	20	JPN	30	0	0
2019	1	MYS	111112	1	1	CHN	10	USA	10	1	1
2019	1	MYS	111112	1	1	JPN	20	USA	10	0	0
2019	1	MYS	111112	1	1	CHN	10	CHN	20	0	0
2019	1	MYS	111112	1	1	CHN	10	CAN	20	0	0
2019	1	MYS	111112	1	1	JPN	20	CAN	20	0	0
2019	1	MYS	111112	1	1	JPN	20	JPN	10	0	0

TrumpTariff = 1 if HS code is Trump tariff goods.

TrumpEffective = 1 if TrumpTariff = 1 & year month is after the effective month of Trump tariffs, i.e., August, or September 2018

Roundabout dummy = 1 when ExpUSA_ImpCHN_dummy = 1 & TrumpEffective = 1

From the trade statistics, I constructed all the combinations of export partners and import partners for each HS code. The first line shows that the reporter country (MYS (Malaysia)) imported US\$10 million of HS 111111 goods from China and exported US\$10 million of the same HS 111111 goods to the US. The TrumpTariff dummy takes the value of 1 if the good is on the Trump tariff list (irrespective of the

partner country). In the example, HS 111112 is on the Trump tariff list; thus, the TrumpTariff dummy takes a value of 1. TrumpEffective takes a value of 1 if the good is on the Trump tariff list and the year and month are after the month when the Trump tariff became effective. The ExpUSA_ImpCHN_dummy takes a value of 1 if the export partner is the US and the import partner is China. The Roundabout dummy takes a value of 1 if both the ExpUSA_ImpCHN_dummy and TrumpEffective are 1. With this data structure and the above estimation equation, $\beta_2 \ln Imp_{ymip} * RoundaboutDummy$ picks up the roundabout trade.

Appendix for the three conditions in section 3.

Condition 1: Increase in both export value to the US and import value from China by more than or equal to US\$1 million

Condition 2: The gap between increases in export value to the US and import value from China is within 20%*

Condition 3: Both imports and exports increased by more than twice**

Imports from China				Exports to US				Gap	Constraints		
Imports before	Imports after	Increase or decrease	Growth(X)	Exports before	Exports after	Increase or decrease	Growth(Y)	US increase/ China increase	Condition 1	Condition 2	Condition 3
10	110	100	10	30	130	100	3.33333333	1=100/100	○	○	○
1000	1100	100	0.1	3000	3100	100	0.03333333	1=100/100	○	○	-



* : $0.8 < Y/X < 1.2$
 ** : Growth > 1 (Both China and US)

Table A1. Dubious Cases of Roundabout Trade with a Broader Criteria

HS2	Reporter							
	Canada	India	Malaysia	Mexico	Philippines	Rep. of Korea	Viet Nam	Total
	No.	No.	No.	No.	No.	No.	No.	No.
3	1	0	0	0	0	1	0	2
20	0	0	0	0	0	1	0	1
25	1	0	0	0	0	0	0	1
28	1	2	0	0	0	0	0	3
29	1	2	0	0	0	1	0	4
33	0	0	0	0	0	0	1	1
34	0	0	1	0	0	0	0	1
37	0	0	0	0	0	0	0	0
38	0	0	1	0	0	0	0	1
39	1	1	1	0	0	3	1	7
40	1	3	1	0	0	0	0	5
42	0	0	0	0	0	0	0	0
44	0	1	2	0	1	0	0	4
48	1	1	1	1	0	0	0	4
56	0	0	0	1	0	1	0	2
60	1	0	0	0	0	0	0	1
68	0	0	0	1	0	1	0	2
69	1	0	0	0	0	0	0	1
70	0	2	0	0	0	0	0	2
73	0	0	0	0	0	0	0	0
74	0	2	0	0	0	1	0	3
75	0	0	0	0	0	0	0	0
82	0	0	0	0	0	1	0	1
83	0	0	0	0	0	0	0	0
84	4	5	1	1	1	3	1	16
85	1	3	3	0	0	2	2	11
86	0	1	0	0	0	0	0	1
87	0	0	0	0	1	0	0	1
90	0	0	0	1	2	0	1	4
94	0	1	0	0	0	0	0	1
Total	14	24	11	5	5	15	6	80

Source: Author's elaboration from the trade data.

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