U.S. Trade Wars and Socioeconomic Outcomes*

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Abstract

We investigate the short-run impact of the US-China trade war on various socioeconomic outcomes in the United States. Using monthly and quarterly data from 2016 to 2021, and exploiting the plausible exogenous nature of the trade war tariffs, we find evidence that the retaliatory tariffs imposed by China on US exports have brought about economic distress. Counties that were more exposed to such tariffs exhibit a greater decline in employment growth, a greater increase in debt-to-income ratios, and a greater increase in some non-violent crime rates like gambling and drug-related offenses.

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1 Introduction

International trade has important distributional impacts (Autor, Dorn, and Hanson (2013)). International trade shocks can also be linked to a wide array of socioeconomic outcomes (Pierce and Schott (2020), Dorn, Hanson, et al. (2019)). The US-China trade war starting in January 2018 was a large and unexpected turn of events. In this paper, we exploit the plausible exogenous nature of these tariffs to investigate the short-run effects of the U.S.-China trade war.

Economists have long recognized that free trade has the potential to raise living standards and that both the importing and exporting countries gain by engaging in trade. The growing body of empirical evidence supports the view of most theoretical trade models that trade reallocates resources within a country. Evidence suggests that while the countries benefit overall, there are some losers as well. Trade's adverse effects appear to be highly geographically concentrated and long-lasting in developing and developed countries alike. The harmful effects of trade are permanent for some workers that lose their jobs to import competition. The economic distress then also translates to other socioeconomic outcomes. For example, Pierce and Schott (2020) find that regions that were more exposed to the China shock exhibit relative increases in fatal drug overdoses; Autor, Dorn and Hanson (2019) find that young adult males were disproportionately hurt due to the China shock, which in turn raised their idleness and premature mortality.

The 2018 trade war between the U.S. and its trading partners will also likely have distributional consequences across industries, and across regions with different patterns of comparative advantage.

2 Overview of the Sino-American Trade War

Following is a brief overview of the trade war timeline. Wong and Koty (2018) and Bown and Kolb (2018) are two excellent resources which track the timeline of events for the trade war that started in January 2018.

First wave: In October 2017, the United States International Trade Commission found that imports of solar panels and washing machines have caused injury to the U.S. solar panel and washing machine industries and recommended that President Trump impose "global safeguard" tariffs. These tariffs of 30 percent on all solar panel imports, except for those from Canada, (worth US$8.5 billion) and 20 percent on washing machine imports (worth US$1.8 billion) went into effect in February 2018.

Second wave: In April 2017, the office of the United States Trade Representative (USTR) was authorized to investigate whether steel and aluminium imports pose a threat to national security and in March 2018, the U.S. imposed a 25 percent tariff on all steel imports (except from Argentina, Australia, Brazil, and South Korea) and a 10 percent tariff on all aluminium imports (except from Argentina and Australia). Along with some other countries, China retaliated with tariffs on U.S. aluminum waste and scrap, pork, fruits and nuts, and other US products, worth $2.4 billion in export value to match the U.S. steel and aluminum tariffs covering Chinese exports worth $2.8 billion. Subsidies for American farmers were then announced to provide relief from falling U.S. agricultural exports.

Third wave: In August 2017, the USTR initiated an investigation into certain acts, policies and practices of the Chinese government relating to technology transfer, intellectual property and innovation. In March 2018, after finding China guilty of unfair trade practices, the U.S. announces

its China-specific import tariffs, which get implemented in three stages: (i) In June 2018, U.S. tariffs on $34 billion of Chinese imports go into effect, which targets mostly intermediate inputs and capital equipment in sectors like machinery, mechanical appliances, and electrical equipment. In parallel with U.S. import tariffs, China's tariffs on $34 billion of US imports also go into effect, which mostly target U.S. transportation (vehicles, aircraft, and vessels) and vegetable products (largely soybeans). (ii) In August 2018, the U.S. imposed tariffs on another $16 billion of imports from China. China immediately responded with its own revised tariffs on $16 billion of US exports. (iii) In September 2018, the largest wave of the U.S.-China trade war went into effect. U.S. tariffs on $200 billion of Chinese imports take effect, along with retaliatory tariffs by China on $60 billion of U.S. imports. These are tariffs on intermediate goods, capital goods, and also consumer goods.

3 Data and Empirical Strategy

3.1 Tariff Data

U.S. import tariffs and Chinese retaliatory tariffs on U.S. exports for the events described in Section 2 come from Bown (2021). Following Waugh (2019)[1], I first convert the tariffs from Harmonized System (HS) 6-digit product level to the 3-digit North American Industry Classification System (NAICS) level by taking a trade-weighted average of the tariffs in the following manner:

$$\tau^z_{jt} = \sum_{p \in P} \frac{F_{p,j,2017}}{F_{j,2017}} \tau^z_{pt}, \tag{1}$$

where τ^z_{jt} is the monthly 3-digit NAICS industry level tariff measure and τ^z_{pt} is the monthly HS6 product level tariff measure. $z \in \{m, x\}$, where τ^m stands for import tariff and τ^x stands for export tariff. $F_{p,j,2017}$ is the amount of trade in 2017 at the product level, whereas $F_{j,2017}$ is the amount of

[1] A working paper by Waugh (2019) studies the effect of Chinese retaliatory tariffs on county-level consumption, proxied by new auto sales and finds a decline in consumption growth. He also finds a decline in employment growth.

trade in 2017 at the industry level. For import tariffs, I use 2017 import values as weights, whereas for retaliatory tariffs, I use 2017 export values. Monthly trade data for total U.S. imports, U.S. exports and China-specific imports and exports come from U.S. International Trade Data of the Census Bureau. I then create monthly county-level measures of import tariff exposure and Chinese retaliatory tariff exposure measures from January 2016 to March 2021 in the following manner:

$$\tau_{ct}^{z} = \sum_{j \in J} \frac{L_{c,j,2017}}{L_{c,2017}} \tau_{jt}^{z}, \tag{2}$$

where τ_{ct}^{z} is the monthly commuting zone-level tariff measure and τ_{jt}^{z} is the monthly industry-level tariff measure. $L_{c,j,2017}$ is the employment level in 2017 at the commuting zone-industry level, whereas $L_{c,2017}$ is the employment level in 2017 at the commuting zone level. τ_{ct}^{z} captures region-specific tariffs such that if a commuting zone mostly employs workers for a certain industry which has a high tariff, then the commuting zone-level tariff will reflect the high tariff.

Table **??** reports summary statistics for the commuting zone-level change in tariffs from December 2017 to December 2018. Across 722 commuting zones, the average import tariff increased by 1.06 percent, whereas the average export tariff increased by about 1.32 percent.

3.1.1 Employment Data

Monthly county and industry level data on employment comes from the Quarterly Census of Employment and Wages (QCEW) of the Bureau of Labor Statistics (BLS), which covers about 97 percent of all employment in the U.S. The source data for the QCEW comes from the Unemployment Insurance (UI) program of the U.S. I use two different measures of employment: total private employment, which excludes government employment, and total private, goods-producing employment but mostly use the latter because it is more likely to capture employment in the tradable

Table 1: Effect of Tariffs on Employment Growth

	Total employment		*Goods employment*	
	(1)	(2)	(3)	(4)
ΔTariffs on U.S. Exports	-0.66***	-0.21*	-1.02***	-0.30
	(0.16)	(0.12)	(0.39)	(0.27)
ΔTariffs on U.S. Imports	-0.53***	-0.04	-0.20	-0.32**
	(0.14)	(0.07)	(0.24)	(0.16)
Observations	157,497	111,144	156,627	110,517
Period: Jan 2016 to Mar 2021	Y		Y	
Period: Jan 2016 to Dec 2019		Y		Y

Notes: Regressions are weighted by county's population in 2016 (Source: U.S. Census Bureau). Standard errors are clustered at the county level. The coefficients are statistically significant at the *10%, **5%, or ***1% level.

goods sector. Table **??** shows that the average private sector employment in 2017 was 164,000 and the average private sector goods producing employment was 29,000.

3.2 Estimation

I closely follow Waugh (2019) to study the effect of import and export tariffs using the following specification:

$$\Delta \ln outcome_{ct} = \beta_c + \beta_t + \beta_m \Delta \ln(1 + \tau^m_{ct}) + \beta_x \Delta \ln(1 + \tau^x_{ct}) + \varepsilon_{ct}, \tag{3}$$

where $\Delta \ln outcome_{ct}$ is the 12-month log difference in the outcome variable in county c, $\Delta \ln(1+\tau^m_{ct})$ is the 12-month log differenced tariff rate on U.S. imports, and $\Delta \ln(1 + \tau^x_{ct})$ is the 12-month log differenced tariff rate on U.S. exports. This specification includes county fixed effects, which control for county specific growth and time fixed effects. Standard errors are clustered at the county level and regressions are weighted by the county population in 2016.

3.3 Results

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Table 2: Effect of Tariffs on Debt-to-Income Ratio

	Lower bound		*Upper bound*		*Average value*	
	(1)	(2)	(3)	(4)	(5)	(6)
ΔTariffs on U.S. Exports	0.73**	0.58	0.74**	0.65*	0.74**	0.60*
	(0.35)	(0.38)	(0.37)	(0.38)	(0.33)	(0.35)
ΔTariffs on U.S. Imports	0.33	0.40	-0.07	0.01	0.10	0.20
	(0.25)	(0.26)	(0.27)	(0.27)	(0.24)	(0.24)
Observations	52,757	37,238	47,372	33,561	52,757	37,238
Period: Jan 2016 to Mar 2021	Y		Y		Y	
Period: Jan 2016 to Dec 2019		Y		Y		Y

Notes: Regressions are weighted by county's population in 2016 (Source: U.S. Census Bureau). Standard errors are clustered at the county level. The coefficients are statistically significant at the *10%, **5%, or ***1% level.

Table 3: Effect of Tariffs on Crime Rates

	Offenses against family	Vandalism	Embezzlement	Gambling	Drug Crimes
	(1)	(2)	(3)	(4)	(5)
ΔTariffs on U.S. Exports	-44.02	-45.41	11.95	22.94*	1398.87*
	(45.64)	(74.63)	(49.44)	(13.90)	(833.55)
ΔTariffs on U.S. Imports	-11.90	-112.59	-3.71	-41.92	-949.30
	(35.11)	(89.34)	(21.00)	(26.37)	(955.16)

Notes: The number of observations in these regressions is 111,708. The time period is January 2016 to December 2019. Regressions are weighted by county's population in 2016 (Source: U.S. Census Bureau). Standard errors are clustered at the county level. The coefficients are statistically significant at the *10%, **5%, or ***1% level.

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