The Return to Protectionism: A First Look at the 2018 Trade War*

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Abstract

Protectionism is on the rise. In 2018, after decades of leading efforts to reduce global trade barriers, the United States enacted several waves of tariff increases on trading partners. As of July 2018, the U.S. has increased tariffs on 11,996 products worth $303 billion, 12.6% of U.S imports. The average tariff rate on targeted imports has increased from 2.6% to 25.4%. In response, U.S. trade partners have retaliated by imposing tariffs on 2,087 products valued at $96 billion, or 6.2% of U.S. exports. We examine the economic consequences of the 2018 Trade War on U.S. trade, prices, and employment. We further assess economic and political explanations for why it has occurred. Preliminary results detect almost immediate impact of tariffs on trade values. They also suggest that a standard median-voter rationale may be behind U.S. and retaliatory tariffs. The results will be updated in real time as new data become available.

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1 Introduction

In 2018, after decades of leading efforts to lower international trade barriers, the United States enacted several waves of tariff increases targeting specific products, sectors, and countries. To date, the U.S. has enacted tariff increases on $303 billion worth of imported products – covering 12.6% of the 2017 U.S. imports – and threatened additional tariffs on billions more. These measures represent the most comprehensive protectionist trade policies implemented by the U.S. since 1971, when President Richard Nixon exited Bretton Woods, closed the gold window, and implemented a 10% import surcharge on all imports.[1] In response, trade partners have imposed retaliatory tariffs on U.S. exports. These counter-measures have so far targeted 2,087 export products valued at $96 billion, or 6.2% of the 2017 U.S. exports.

This return to protection is unprecedented in the post-war era in terms of the sizes of the economies involved, the magnitudes of the tariff increases, and their breadth across sectors. Hence it provides the ideal setting to examine if and how trade policy affects key economic outcomes. We examine the political economy drivers and the economic consequences of the 2018 trade war: Why did it unfold as it did? What is its impact on U.S. trade, prices, and employment? We use publicly-available data to build a database of line-level tariff changes as new waves of tariffs are implemented by the U.S. and its trading partners. This tariff-line dataset is constructed by scraping online official documents of the U.S. and its trade partners in real time. We use existing and newly assembled concordances to match these trade policies to publicly-available trade data and to monthly datasets that track employment, wages, domestic prices, and consumer expenditures across both sectors and regions. As new data become available, the results of the paper will be updated.

First, we examine the economic consequences of this return to protectionism on key sectoral and regional outcomes of the U.S. economy. Using standard difference-in-difference, we estimate the effects of both U.S. and retaliatory tariffs on U.S. trade patterns, prices, wages, employment and consumer expenditures. We compare these outcomes across U.S. sectors, products, and varieties that are targeted by U.S. or retaliatory tariffs relative to non-targeted sectors, products and varieties. At the subnational level, we inspect the responses of employment and wages across U.S. regions that are differentially exposed to the tariff shocks, and examine whether or not retaliatory tariffs set by U.S. trade partners offset some of the regional effects of U.S. protectionism. We assess the welfare consequences of these effects across workers and regions using a standard model of international trade.

[1] This "Nixon shock" was the first general increase in tariffs by the U.S. since the 1930 Smoot-Hawley Act (Irwin, 2013).

Second, we examine the political economy drivers of this return to protectionism. We seek to explain the structure of commercial policy –which sectors and countries are targeted by U.S. tariffs and which U.S. sectors are retaliated against. We ask if the observed patterns of protection and retaliation in the 2018 trade war can be rationalized by some of the main long-standing theories of endogenous trade policy. We assess hypotheses borne out of three classic theories. First, under unilaterally optimal trade policy with income maximizing governments, tariffs should be larger in sectors with more inelastic foreign supply of exports. Second, if tariffs are set to influence electoral outcomes in the U.S., a standard median-voter argument, in the tradition of Mayer (1984) and Helpman (1995), implies that tariffs should be higher in industries hosted by regions whose voters are more likely to be swayed in an election. Third, we consider the predictions of the standard political contribution model of Grossman and Helpman (1994).

Although only a few months have passed since the U.S. implemented tariffs, we detect immediate responses on trade flows. We use a difference-in-difference research design to compare values, quantities, and prices of imports and exports targeted by tariffs against comparison categories. Imported products that are targeted with tariffs fall -15.7% relative to a benchmark comparison group in the period since the tariffs were implemented. Within the targeted products, the varieties (product-country pairs) directly targeted by tariffs fall relatively more and experience an increase in tariff-inclusive prices. The retaliatory tariffs imposed on U.S. exports have resulted in -8.1% declines relative to a comparison group.

Our preliminary finding suggest that, consistent with a median-voter framework, U.S. import tariffs have been aimed at protecting employment in industries that concentrate in politically competitive "swing" counties. Additionally, our preliminary findings suggest that foreign governments have retaliated by also targeting those same counties. In contrast, a standard terms of trade argument geared towards national income maximization is unlikely to be a primary explanation for the structure of protection since we find very little variation in tariffs increases.

2 Data

This section describes the data. All datasets are publicly available and we develop several original concordances to merge datasets together.

2.1 Trade Data

We obtain a monthly country-product panel of U.S. trade data from the U.S. Census Bureau. These data are the official administrative datasets used to compile U.S. trade statistics, and track bilateral

import and export flows to and from all world countries using detailed 10-digit Harmonized System Tariff (HS) product codes. The Census publishes data with a two-month lag, and we have developed an automated procedure to quickly incorporate the most recent data into our analyses in near-real time. Following the convention of the international trade literature, we refer to HS10 codes as *products* and to HS10-country pairs as *varieties.* We refer to HS4 codes as *sectors.*

We use the subset of the Census data including all countries with annual 2017 U.S. imports of greater than $1 billion.[2] The resulting panel includes 76 countries that collectively cover more than 99% of 2017 US imports and more than 97% of 2017 US exports. We begin our sample period in January 2013, five years before the U.S. government implemented the first wave of tariff increases in January 2018.

2.2 Tariff Data

We use two measures of tariffs on US imports: the *statutory* tariff rate and the *effective* tariff rate. The statutory tariff rates are obtained from official documents from the U.S. International Trade Commission (USITC) enumerating the legal tariff schedule on all products and countries. In years prior to 2018, the USITC typically released an annual baseline tariff schedule in January and a revised schedule in July. Changes in the tariff schedule typically reflected expected and longstanding treaty commitments to reduce rates over an extended time period. In 2018, by contrast, USITC has so far issued 11 schedule revisions at a pace greater than one per month, reflecting a rapid series of trade policy initiatives authorized by the executive branch of the U.S. government.

The effective tariff rate is collected directly from the U.S. import data. Census data report both total import values and the value of duties collected at the border. The effective tariff rate is the ratio of import duties to import value. While the statutory and effective tariff rates align is most cases, there are cases when they may differ. For example, statutory tariff increases on washing machine and solar panel imports become effective only after U.S. trading partners surpass an exempted quota allowance.

We use official documents issued by the World Trade Organization (WTO) and foreign government finance ministries to measure statutory retaliatory tariff rate increases on U.S. exports enacted by trading partners. To obtain the baseline tariff rates prior to the retaliatory measures, we use the annual WTO database of Most Favored Nation (MFN) tariff rates, available at the 6-digit HS-country level. We then compute the *retaliatory* tariff rate for each country-product as the sum of the MFN rate and announced tariff rate change.

[2]The reason for this restriction is to reduce the data to a more tractable size.

In Figure 1 we show the evolution of statutory, effective, and retaliatory tariff rates since the beginning of the trade war in 2018. The lagged onset of effective tariff rate increases for solar panels and washing machines is illustrated in the differences between tariff rates on those products in Panels and B. More broadly, the panels highlight substantial increases in tariff rates on U.S. imports and exports as an expanding number of products and countries have been targeted since January.

2.3 Price Data

We use the Census trade data to compute two border price measures. We compute monthly origin country-product free-on-board (FOB) unit values as the ratio of value to quantity, and compute the tariff-inclusive price as (value + duties)/quantity. For U.S. export prices, we analogously define the FOB price as the ratio of value to quantity for each product-destination pair and tariff-inclusive prices as value/quantity multiplied by the statutory rate (we do not observe actual duties collected by the foreign governments on U.S. exports).

The BLS Producer Price Index (PPI) measures the prices received by U.S. producers of goods and services. The data are available at monthly frequency and reported for more than 500 industries and 4,000 product lines. Industries and product lines are classified using the North American Industry Classification System (NAICS), and covers virtually all tradeable domestic output and more than 70% of domestic services output.

We collect price data on consumer goods from the Bureau of Labor Statistics (BLS) Consumer Price Index (CPI). Our main measure is the national annual price index for all urban consumers, which covers approximately 90% of the U.S. population. BLS produces composite price indices for major categories of expenditures (such as food, housing, apparel) as well as disaggregated estimates for specific goods and services called entry-level items (such as milk, housing rent, and men's pants). We begin our sample in January 2013 and retain only the disaggregated entry-level item codes.

2.4 National Employment Data

The BLS Current Employment Statistics (CES) database provides monthly industry estimates of non-farm employment, hours, and earnings from payroll data. Industries are classified using NAICS codes, and data are available at the national and state level, as well as for over 400 major metropolitan areas. We also collect county-level employment data, described in detail below.

2.5 County-Level Data

We use county-level data to evaluate political economy explanations for the tariff increases and to assess spatial heterogeneity in the costs and benefits of the tariff increases. There are several possible choices for the unit of spatial analysis. Autor et al. (2013) use commuting zones as a proxy for local labor markets in their analysis of the impact of Chinese imports on U.S. employment. Autor et al. (2017) match Congressional voting district data to the commuting zone to examine the relationship between Chinese imports and political polarization. Che et al. (2016) examine the impact of Chinese competition on U.S. elections at the county level. We choose to work at the county-level, as it allows us to work cleanly with a broad spectrum of publicly available social, economic, and political data sets. Moreover, counties are always subsets of states and, in most cases, subsets of Congressional districts as well. These feature make county-level data an attractive unit of analysis for political economy analysis.

The Census Bureau County Business Patterns database provides annual industry employment data at the county-level. The data are constructed using a variety of administrative and survey sources, including the Census Business Register, the Economic Census, the Annual Survey of Manufacturers, and the Current Business Surveys. Industries are classified by NAICS codes. We use the most recently available data from 2016 to compute the employment share of each county in the manufacturing sector.[3]

We obtain county-level demographic statistics from the U.S. Census American Community Survey, an annual household survey conducted to provide up-to-date population estimates in the periods between the decennial censuses. The 5-year ACS sample from 2012-2016 includes large samples of respondents even for small U.S. counties, and is thus ideal for our purposes. The variables we use from this dataset are: white population share, population share with a college degree, unemployment rate and labor force participation rates, and median household income,

The Federal Election Commission publishes official county-level vote totals for all federal elections, including for presidential, state, and Congressional elections. We use this data to compute the county-level two-party vote share earned by the two major American political parties in state and presidential contests from 2012 to 2016.

2.6 Input-Output Tables

To account for the indirect effects of trade on prices, we use the Bureau of Economic Analysis (BEA) annual input-output (I-O) accounts. The IO accounts describe the total value of goods

[3]Manufacturing sectors are defined as those from NAICS code 31-33.

and services purchased and produced by major industries in the U.S. economy. We obtain the standard "Use" tables and compute industry-level estimates of commodity inputs as a share of total industry output. We collect data from two periods: the most recently available I-O data from 2016, and the most recently available benchmark census year in 2007. The benchmark tables in 2007 provides more detailed industry coverage than is available in 2016. The I-O data also include estimates of the total value of goods and services imported by each industry, although these estimates are not disaggregated by commodity or country of origin. We therefore assume each industry imports from all commodities and countries at an equal rate.

2.7 Analysis Datasets

Merging the data sources described above requires using detailed concordances between disparate classification structures. Toward this end, we have developed several new concordances and have incorporated concordances constructed by others. Our concordances allow us to link datasets using HS6, NAICS, CPI, and UCC codes, allowing us to integrate a diverse collection of economic indicators and at different levels of aggregation.

Using the data sources and concordances described, we construct the following datasets for analysis. The sample period for all panel datasets is 2013-present.

1. *Trade Flows Dataset.* To study the impact of tariff increases on trade flows, our unit of analysis is a monthly panel of HS10-country codes, constructed using U.S. Census trade data and our original tariff line dataset. This dataset allows us to study the impact of tariffs on values, quantities, prices, and tariff revenue using detailed product-by-country level administrative data observed at the U.S. border.

2. *Industry Dataset.* To study the impact on employment, our unit of analysis is a monthly panel of national NAICS-6 industry data. The panel includes data on domestic producer prices, employment, and wages, and covers more than 500 industries, including virtually all manufacturing output and more than 70% of annual services output. We map tariffs to industries using a HS6-NAICS concordance.

3. *Consumer Price Dataset.* To study the impact of tariffs on consumer prices, our unit of analysis is a monthly panel of CPI codes. We map our tariff dataset to CPI codes using an original concordance from HS6 codes to CPI codes.

4. *County Dataset.* To study the economic and political drivers of recent U.S. tariff policies, we construct a cross-sectional dataset at the U.S. county-level. We map tariff rates to counties

using country-level industry (NAICS) employment weights, and explore spatial co-variation in the concentration of tariff rate increases with a range of economic, political, and social county characteristics.

3 Tariff Waves: Background and Descriptive Statistics

This section provides an overview of the primary events, policymakers, laws, and institutions involved in the 2018 trade war. We give a timeline of key events and describe the legal authorities invoked by the U.S. government for each wave of tariffs.

The trade war began modestly in January 2018 when U.S. President Donald Trump formally announced tariff increases on $8 billion of solar panel and washing machine imports. These tariffs were authorized under Section 201 of the Trade Act of 1974, a law permitting the U.S. president to unilaterally apply temporary protectionist measures if imports cause "serious injury" to domestic industries. Such legal provisions, known as "safeguard tariffs," are explicitly permitted by the World Trade Organization under GATT. Private American firms may formally petition the US International Trade Commission to request protectionist measures, and indeed, large solar panel and washing machine manufacturers such as SolarWorld and Whirlpool filed petitions in spring and summer of 2017 alleging they have suffered unreasonable economic losses due to foreign competition. The US International Trade Commission conducted public hearings throughout the summer and fall, and in November 2017 issued reports recommending to the President that the companies' petitions be approved. Tariffs were officially announced in January 2018 and implemented in February. Panel A of Table 1 provides a summary of the tariff increases.

The U.S. government's second wave of tariffs, announced in March 2018, targeted iron, aluminum and steel products. Initially, large trading partners and allies including Canada, Mexico, and the European Union were exempt from these tariffs; however, the exemptions were rescinded in June. President Trump authorized the measures under Section 232 of the Trade Expansion Act of 1962, an infrequently invoked legal clause allowing the president to enact tariffs if "an article is being imported into the United States in such quantities or under such circumstances as to threaten or impair the national security." Row 3 of Table 1 reports that this wave has affected 818 products worth $48 and increased tariff rates by 10-20 percentage points.

The largest waves of tariffs implemented by the U.S. government to date target approximately $247 billion worth of imports from China. Citing widespread complaints from American businesses that China fails to respect international intellectual property rules, in March 2018 President Trump authorized tariffs under Section 301 of the Trade Act of 1974, which allow the U.S. president

to unilaterally retaliate against trading partners for violating international trade agreements or engaging in "unfair" trade practices. Tariffs on approximately $50 billion of Chinese imports were implemented in July, and the scope and value of targeted products has expanded as the dispute has steadily escalated. Row 5 of Table 1 indicates that tariffs on China now affect 11,162 imported products worth 247 , and increased tariffs, on average, from 3.0 % to 26.2 %.

The final row of Table 1 reports the total affected imports to date. Tariffs have targeted 11,996 products and a total of 14,931 varieties. In 2017, these imports were valued at USD 303 million, or 12.6% of imports. The average statutory tariff rate on these imports increased from 2.6% to 25.4%.

Panel B of Table 1 reports the retaliatory tariffs of major trade partners. At the time of this writing, Canada, China, Mexico, Russia, Turkey, and all member countries of the European Union have enacted retaliatory tariffs against the US. The Indian government announced specific countermeasures in May 2017 but has repeatedly delayed implementation. Japan formally notified the WTO that it reserves the right to retaliate, but has not yet taken action. Collectively, these countermeasures cover approximately $96 billion in annual U.S. exports (6.2)% of exports across 2,087 products and 5,114 export varieties. The average statutory tariff rate on these exports increased from 7.1% to 35.2%.

The governments of Canada, Mexico, and the European Union coordinated their responses to maximize political leverage in the conflict. Retaliatory tariffs on American whiskey and cheese, for example, appear intended to exert economic and symbolic pressure on the U.S. Congressional leaders, whose constituent districts specialize in those products. Affected countries have initiated proceedings to challenge the legality of U.S. trade actions, and many leading experts have speculated that the results of the arbitration process overseen by the WTO is likely to have significant consequences for the rules-based international trading system.

Panel C of Table 1 provides a broad sectoral breakdown of the U.S. tariffs and retaliations. Using the HS classification, we can classify all products as agriculture (chapter 01-24) or manufacturing (chapters 25-99). The table reveals that the U.S. has nearly exclusively targeted manufacturing imports, whereas approximately 30% of retaliations by U.S. trading partners have targeted agriculture goods. An alternative way to observe what types of products are targeted is to use our concordance that matches HS codes in the trade data to CPI codes the BLS Consumer Price Index. Products that can be directly linked through this concordance are final consumer goods.[4] The table shows that targeted consumer goods comprise approximately 2.3% of annual U.S. imports, and the corresponding number for retaliatory tariffs is 1.8%.

[4]Because the CPI data do not cover 100% of final consumer goods, this estimation should be viewed as a lower bound.

4 Reduced Form Impacts

This section examines the impact of the tariffs on trade volumes and values, prices (border, producer and consumer), and employment using reduced form methods. The guiding aim of these results is to summarize the impacts through transparent specifications. While these results cannot be used to quantify the aggregate consequences of tariffs, they are useful to discern if tariffs have measurable effects on relative outcomes between targeted and non-targeted products, countries and sectors.

4.1 Trade

The Census publishes trade flows data at a two-month lag. The specifications below are thus estimated using publicly available data from January 2013 through July 2018. As a result, only $82of the total $303targeted import products, and $58of the $96products hit with retaliatory tariffs, are incorporated into the present analysis.

We partition all the import varieties in our data (i.e., HS10-country pairs) into three mutually exclusive groups. *Targeted* country-product import varieties are those subject to tariff increases in one of the 2018 tariff waves. For example, the "Washing Machines" wave includes Korean imports in HS10 8450110010, "Household- or laundry-type washing machines, including machines which both wash and dry; parts thereof: Machines, each of a dry linen capacity not exceeding 10 kg: Fully automatic machines." *Exempt* varieties share the same HS10 as targeted varieties, but are not subject to tariff increases due to country-level statutory exemptions (e.g., Canadian imports in HS10 8450110010). *Similar* varieties share the same HS4 as targeted varieties, but are never subject to tariffs in any country (e.g., imports in HS10 8450120000, "Household- or laundry-type washing machines, including machines which both wash and dry; parts thereof: Machines, each of a dry linen capacity not exceeding 10 kg: Other machines with built-in centrifugal dryer"). We drop import varieties that do not fall into one of these group groups, since these varieties do not serve as a meaningful comparison group to estimate time trends and impose an unnecessary computational burden.

We analogously partition U.S. exports into three groups. *Targeted* varieties are U.S. exports directly subject to tariff increases in one of the waves. *Exempt* varieties are exports to countries that do not impose retaliatory tariffs but share the same HS10 classification. *Similar* varieties are exports that share the same HS4 as targeted varieties but are never subject to retaliatory tariffs in any country. We drop export varieties that do not fall into one of these three groups.

We restrict our sample to varieties that can be classified into one of these mutually exclusive and time-invariant groups. To ensure the classifications are time-invariant, we assign a variety to the target group if it is targeted in any period, and we assign a variety to the exempt group if it is never targeted but otherwise meets our exemption criteria at some time period in the sample. For instance, if a variety is initially exempt in an early tariff wave but is targeted in a later wave, we assign the variety to the *target* group. If a variety is initially *exempt* in an early wave and is *similar* for a later wave, we assign the variety to the *exempt* category.

We also examine aggregate import and export data collapsed to the product level. Here, we define *targeted products*, HS as those that have at least one targeted variety. The comparison group for these are *similar products,* which are products that do not contain any targeted variety. Using the example above, HS 8450110010 is a targeted product and 8450120000 is a similar product.

Table 2 reports the breakdown of varieties that are classified as targeted, exempt and similar in each tariff wave.

We first examine product-level outcomes using a standard difference-in-differences specification. The data are collapsed to the product level and we compare outcomes on targeted products relative to similar products. The specification is

$$\ln y_{ht} = \alpha_h + \alpha_{st} + \beta_1 \left(\text{post}_{ht} \times \text{targetproduct}_h\right) + \epsilon_{ht} \tag{1}$$

where, as discussed above, targetproduct_h is a dummy if product h contains at least one variety targeted with a tariff. The post_{ht} dummy is an indicator that switches on in the month that the product is targeted with a tariff increase (the level effect is not identified because of the sector-time fixed effects). The specification includes product and HS4 sector-time fixed effects. The time trends control for secular changes in sectors that could affect import and export outcomes, and the similar products pin down these time trends. We cluster standard errors at the tariff line level: HS8 for imports and HS6 for exports. The outcomes are product-level values, quantities, FOB unit values, and number of varieties (i.e., the number of countries within the product). We further examine tariff-inclusive unit values, defined as the sum of values and duties collected divided by quantity.

The results for the import data are reported in Table 3. Column 1 reports the results for import values. Relative to the untargeted products, imports in targeted products change -15.7%, a decline that is large in magnitude and statistically significant. Column 2 shows that this value decline is essentially matched by changes in quantities, and so we do not observe a differential change in fob unit values (columns 3). The number of observations in these columns differ from column 1 because of missing quantities. Column 4 examines product-level unit values that include all tariff duties. There is no statistically significant change (although it is positive) in the targeted products.

This suggests that although we observed an increase in tariff-inclusive prices for target *varieties*, at the product-level we do not observe a differential change. The final column indicates that import varieties decline -3.2% relative to untargeted products. These findings suggest that the tariffs have led to an immediate reallocation away from targeted products towards related products that have not been targeted with tariffs.

The results for the export data are reported in Table 4. Column 1 reports the results for export values. Relative to the untargeted products, U.S. exports in targeted products change -8.1%, a decline that is large and statistically significant. Column 3 indicates that U.S. fob export prices have fallen slightly, suggesting a terms-of-trade gain for trade partners, although the decline is not statistically significant. The final column indicates that U.S. export varieties in targeted products decline -3.5% relative to similar products.

To further understand the reallocation patterns, we next examine variety-level outcomes. In these specifications, we compare targeted and exempt varieties to similar varieties using the following specification:

$$\ln y_{hct} = \alpha_{ch} + \alpha_{ct} + \alpha_{st} + \beta_1 \left(\text{post}_{ht} \times \text{target}_{ch}\right) + \beta_2 \left(\text{post}_{ht} \times \text{exempt}_{ch}\right) + \epsilon_{cht} \tag{2}$$

where h denotes a HS10 product, s denotes the (HS4) sector, c denotes country (the origin country for imports, the destination country for exports) and t denotes time (measured in months). As before, the post dummy turns on in the month that product h is hit with a tariff. In addition to sector-time fixed effects, the specification allows us to further control for country-time fixed effects. Standard errors are clustered at HS8 for imports and HS6 for exports.

The baseline import regressions are reported in Table 5. Column 1 reports the differential change in import values for the target and exempt groups relative to similar. Imports from the targeted varieties drop -13.1% and the decline is statistically significant. Interestingly, imports of exempt varieties also decline, registering a -6.1% fall relative to similar. This suggests that the U.S. partially reallocated expenditures from targeted varieties to exempt varieties, but imports into exempt varieties also decline relative to similar varieties. The third panel reports the changes in free-on-board (fob) unit values, define as the ratio of values over quantities. Relative to the similar group, neither target nor exempt varieties exhibit a statistically-significant change in FOB unit values. This suggests that, to date, the tariffs on imports did not generate terms of trade benefits for the U.S. Column 4 reports the unit values inclusive of duties, and the results indicate a sharp increase in prices for the target group. Relative to similar varieties, unit values increase 12.4% and the increase is statistically significant; in contrast, we observe no change in prices for the exempt varieties.

The baseline export regressions are reported in Table 6. Column 1 indicates that U.S. exports directly targeted by retaliatory tariffs have fallen -10.1% relative to similar product and the decline is statistically significant. However, unlike the import patterns, we do not observe a decline in exempt varieties. Column 3 suggests no changes in FOB prices. Column 4 reports unit values inclusive of the statutory rates increase.

4.1.1 Event Study

To explore the dynamics of trade outcomes, we run an event-study analog to (2). The product-level event-study specification is:

$$\begin{aligned} \ln y_{ht} &= \alpha_h + \alpha_{st} + \sum_{j=-13}^{T} \beta_{0j} I\left(\text{months since tariffs}_h = j\right) \\ &\quad + \sum_{j=-13}^{T} \beta_{1j} I\left(\text{months since tariffs}_h = j\right) \times \text{targetproduct}_h + \epsilon_{ht}. \end{aligned} \tag{3}$$

We pool over tariff waves and normalize month of the tariff waves to zero. Time t is measured in months and $I(.)$ is an indicator function. All periods prior to -13 are pooled into a single event time, and this serves as the leave-out period. The coefficient on the targetproduct_h interaction are relative to similar products, and standard errors are clustered at the HS8 level.

The event-study for product-level imports is shown in Figure 2. The upper left panel reports the evolution of import values in targeted products (relative to the leave-out similar products). Although the tariffs may have been anticipated through press and social media reports, in aggregate, we do not observe inter-temporal substitution: prior to tariff implementation, we do not observe a statistically significant increase in import values. In the months that tariffs are implemented, imports of targeted products fall (statistically significant) and continue to decline in the post tariff months. Import quantities illustrate a similar pattern in the upper right panel. The third panel reports the evolution of FOB unit values which shows no statistically significant increase after the tariffs were implemented. The final panel reports unit values that include tariffs. Compared to the third panel, the standard errors are somewhat tighter and suggest an increase in relative prices. As the time elapses and as more data are pulled, we expect the figures to provide a clearer picture of the evolution of each of these outcomes.

The event-study for product-level exports is shown in Figure 3. The export results are noisier since we only have one month of data since retaliatory tariffs were implemented. However, we observe a decline in U.S. exports in targeted products when the tariffs were implemented. We do not observe any clear patterns in the evolution of prices

The groups are the same as before, and standard errors are clustered at the HS8 level. We display the specifications graphically by plotting $\hat{\beta}_j$ for the exempt varieties and the target varieties. These coefficients are relative to the similar leave-out group.

$$\begin{aligned}\ln y_{cht} &= \alpha_{ch} + \alpha_{ct} + \alpha_{st} + \sum_{j=-13}^{T} \beta_{0j} I\left(\text{months since tariffs}_h = j\right) \\ &+ \sum_{j=-13}^{T} \beta_{1j} I\left(\text{months since tariffs}_h = j\right) \times \text{target}_{ch} \\ &+ \sum_{j=-13}^{T} \beta_{2j} I\left(\text{months since tariffs}_h = j\right) \times \text{exempt}_{ch} + \epsilon_{cht}\end{aligned}$$

We pool over tariff waves and normalize the month they are implemented to zero. Time t is measured in months and $I(.)$ is an indicator function. All periods prior to -13 are pooled into a single event time, and we currently pool all periods 3 months since tariff wave. (To date, only two tariff waves have more than 3 months of data since implementation). This serves as the leave-out period. The groups are the same as before, and standard errors are clustered at the HS8 level. We display the specifications graphically by plotting $\hat{\beta}_j$ for the exempt varieties and the target varieties. These coefficients are relative to the similar leave-out group.

The event-study for U.S. imports is shown in Figure 4. The red circles report the evolution of targeted imports relative to the (leave-out) similar group, and the black circles show the evolution of the exempt group. The upper left panel reports import values. Prior to the implementation of the tariffs, we observe an increase in imports of targeted varieties and no increase in exempt varieties. This suggests that anticipating the impending tariffs, U.S. consumers shifted forward their expenditures on imports that were soon to be targeted. In the month that the tariffs on implemented, on average, we do not observe a large decline in imports of targeted varieties. However, within a month, imports fall and the declines are statistically different from the relative group. Although the exempt group also declines, we do not observe conclusive evidence that imports of exempt varieties are statistically different from the similar group. The other panels report the evolution of the other outcomes.

The event-study for U.S. exports is shown in Figures 4. We see a sharp decline in U.S. export varities at the time the tariffs are implemented, and no differential change in export values or quantities of exempt varieties.

4.2 Producer Prices

`in progress`

4.3 Consumer Prices

in progress

4.4 Employment

in progress

5 Aggregate Impacts

We measure the welfare change in the U.S. associated with each policy change using the estimated changes in prices, imports, exports and tariff revenue. We present here the set of equations that we will use to implement these calculations.

Consider a standard general neoclassical economy with multiple goods, factors, and countries. As it is well known, in response to arbitrary policy shocks, the first order approximation to the equivalent variation experienced by the representative U.S. consumer is

$$dW^n = -\sum_g \sum_i m_{ig}^{US} dp_{ig}^{US} + dR, \tag{4}$$

where m_{ig}^{US} are net US imports of good g from country i, p_{ig}^{US} is the price of good g from country i faced by US consumers and producers, and dR is the change in tariff revenue $R = \sum_g \sum_i \tau_{ig}^n p_{ig}^{n*} m_{ig}^n$.

This formula is in principle hard to implement, because the price and net import changes of each product are in general driven by changes in all the tariffs. We make three familiar assumptions to simplify the presentation of the results. First, each good g (an HS10 in our data) is differentiated by origin, as in the Armington model. Second, the country-level import demand m_{ig}^n of commodity g from country i in country n is only a function of the price of good g faced by consumers in the importing country: $m_{ig}^n = m_{ig}^n \left(p_{ig}^n\right)$. Third, the country-level net export supply x_{ig}^n of good g from country i to the world is only a function of the price of good g faced by producers in the exporter: $x_{ig}^n = -m_{ig}^i \left(p_{ig}^i\right)$.[5]

[5]The textbook assumption that are typically to rationalize these reduced-form properties are: i) utility is quasi-linear, $U^n = c_0 + \sum_g \sum_i u\left(c_{ig}^n\right)$ where c_{ig}^n is the consumption in n of good g from i and c_0 is the numeraire good, assumed to be produced in positive quantity; and ii) production of each good uses the same bundle of primary mobile factors as an input (possibly with different intensities), and no intermediate inputs, e.g., $q_{ig} = F_{ig}\left(K_{ig}, L_{ig}\right)$ where q_{ig} is output of good g in i, K_{ig} is a fixed factor and L_{ig} is a bundle of mobile factors (typically assumed to be labor).

Under these assumptions, to a first-order approximation, the equivalent variation to the welfare change of a representative U.S. consumer due to change in the import tariff τ_{ig}^{US} on product g from country n is

$$dW_{ig} = \left(\tau_{ig}^{US} \sum_{n' \neq US} \eta_{ig}^{n'} s_{ig}^{n'} - 1 \right) m_{ig}^{US} dp_{ig}^{US*}, \tag{5}$$

Where $\eta_{ig}^{n'} \equiv \frac{\partial \ln m_{ig}^{n'}}{\partial \ln p_{ig}^{n'}}$ is the net import demand elasticity in n' of the good g from i and $s_{ig}^{n'}$ is country n' quantity share of that good's demand (excluding the US) and dp_{ig}^{*} is the change in the price of that good faced by the US before the domestic tariff. Similarly, the welfare effects of retaliatory tariffs can be evaluated in this standard model. Assuming that U.S. exports do not receive export subsidies to being with, is it easy to show that the equivalent variation to the welfare change of a representative U.S. consumer due to change in the retaliatory tariffs $\left\{ \tau_{USg}^{n} \right\}$ imposed by the U.S. trade partners on product g exported from the U.S. is

$$dW_g = -x_{USg} p_{USg} \sum_{i \neq US} s_i^R d \ln \left(1 + \tau_{ng}^{i} \right) \tag{6}$$

with retaliatory weights $s_i^R = \frac{\eta_{USg}^{i} m_{USg}^{i}}{\sum_{i' \neq US} \eta_{USg}^{i'} m_{USg}^{i'}}$ that depend on each importer demand elasticity and initial level of imports.

These expression provide a basis to assess the good-by-good impact of tariff from objects that we can aim to measure (import shares) or estimate (foreign supply elasticities and price changes). Using these expressions we will compute compute the welfare change from U.S. imposed and retaliatory tariffs $\left\{ dW_g^R, dW_{ig}^T \right\}$ and assess the optimality of the U.S. tariffs. We plan to use either existing estimates of some of the import and export elasticities as well as our own estimates using the multiple changes in tariffs observed in the data.

6 Explaining the Structure of Trade Protection

Our goal is to examine the political economy drivers of the 2018 Trade War. We seek to explain the structure of commercial policy –which sectors and countries are targeted by U.S. tariffs and which U.S. sectors are retaliated against. We assess hypotheses borne out of three classic theories.

6.1 Income Maximization

A view dating back to Johnson (1953) is that with governments choosing to maximize national income, tariffs should be larger in sectors with more inelastic foreign supply of exports. A long-standing

debate still exists on the usefulness of this type of explanation to rationalize the structure of protection. Broda et al. (2008) offer support for this prediction for a set of non-WTO countries as well as for U.S. policy instruments partially covered by WTO agreements. We will rely on our empirical analysis of the effects of tariffs to assess the welfare effects and optimality of the observed tariff changes. From equation 5 is follows that a US tariff increase on an imported good is welfare enhancing as long as

$$\tau_{ig}^{n} < \frac{1}{\sum_{n' \neq US} \eta_{ig}^{n'} s_{ig}^{n'}} \equiv \tau_{ig}^{n*}. \tag{7}$$

where τ_{ig}^{n*} is the optimal bilateral tariff. The typical representation of this equation, as in Broda et al. (2008), assumes a single foreign country, so that $s_{ig}^{n'} = 1$ and $\tau_{i}^{*} = \frac{1}{\eta_{ig}^{i}}$. As in that paper, we will test whether the tariffs chosen by the U.S. correlate with the optimal tariffs τ_{ig}^{n*}. For this, we plan to either use some of the elasticities that they have estimated, as well as those implied by our previous empirical estimates.

However, a preliminary look at the tariff rate increases suggests that optimal tariffs are an unlikely candidate to explain the pattern of protection for either the U.S. or its trading partners. Across all the imports, the U.S. has applied just five possible tariff rate increases: 10%, 20%, 25%, 30%, and 50%. Trade partners have applied just three possible tariff rate increases on U.S. exports: 10%, 20% and 25%. These round number increases are unlikely to align with the true export supply elasticities. Further evidence against optimal tariff theory is to examine the minimum and maximum tariff rate increase applied within HS2 sectors. Table 7 reports this cross-tabulation and there is essentially no variation within HS2 sectors across varieties. To the extent that export supply elasticities would differ across countries and products within broad HS2 sectors, we would expect more variation in the tariff rate increases. Hence, to give a shot to the optimal tariff argument, we must only consider variation in tariffs over HS2 sectors.

6.2 Median Voter

Median voter theory is a standard benchmark to rationalize the structure of trade protection (Hillman 1982, Mayer 1984). If tariffs are intended to boost the electoral prospects of incumbent politicians, the median-voter argument implies that tariffs should be higher in sectors where the median-voter share of ownership of sector-specific inputs is higher (Helpman, 1995). To take a highly stylized example, if workers were immobile across sectors, then tariffs should be higher in the industry where the median voter is employed. As pointed out by Gawande and Krishna (2003), directly testing this prediction is challenging as it requires information on median voter characteristics, typically precluding cross-sectional analysis.

However, this logic can be translated to an implicit spatial model, allowing us to leverage a host of information from the U.S. economy in the 2018 trade war. Specifically, if voters are imperfectly mobile over space, then the "ownership share" of median voters in the specific-factors model corresponds to the sectoral specialization of districts whose electoral outcome is more likely to decide a national election. Assuming that a national election is won by the party winning more districts, tariffs designed to win an election should be higher in sectors commanding larger employment shares in more contested districts.[6] Empirically, this prediction can be assessed using information on sectoral specialization and political preferences of districts, alongside information on tariff changes by sector.

We ask if, during the 2018 trade war, U.S. tariffs were implemented in a way that is consistent with this logic. We also inspect similar questions for retaliatory tariffs, as it is possible that their structure was designed to target industries depending on the political orientation of the regions hosting them. We map tariff rates to U.S. counties using a three-step weighting procedure. First, we compute the monthly trade-weighted average effective tariff rate facing U.S. importers (exporters) at the HS6-level using constant 2013/2014 HS10-country weights.[7] Second, we map the HS6-level tariff rates to NAICS codes, taking a trade-weighted average of the HS6 code that fall within a NAICS code. Finally, we scale each NAICS-level tariff rate by the county-level share of employment in the same NAICS industry.

As a result, we are able to estimate county-level exposure to tariff increases for both U.S. imports and exports. Figures 6 and 7 show their spatial distribution. The graphs show that the spatial distributions of U.S. and retaliatory tariffs are quite similar, suggesting that foreign governments may be seeking to offset the regional effects of U.S. protectionism. Figure 8 shows indeed a high correlation: counties exposed to greater protection from the U.S. government are also exposed to stronger retaliations by U.S. trade partners. In part, this spatial correlation reflects correlation of the targeted sectors, which are primarily in manufacturing. However, as seen in our discussion of Table 1, the overlap is not perfect, with retaliatory tariffs being more concentrated in agriculture.

Figure 9 shows a bin scatter of the county-level tariff increases against the county-level GOP presidential vote share. The top panel shows the U.S. tariffs and the bottom panel shows the retaliatory tariffs. In both cases the best population-weighted quadratic fit of the raw data suggests that counties with more divided vote received both higher tariff increases and stronger retaliation. The best quadratic fit peaks close to 50% vote share. Overall, these preliminary finding suggest that U.S. tariff policy may be designed in a way that protects employment in industries that are

[6] We will derive this prediction formally in the future version of this draft.

[7] We use constant weights constructed from average trade in 2013 and 2014 because time-varying country weights may adjust endogenously to changes in tariff rates.

hosted by politically disputed counties, and that foreign tariffs may be chosen to offset the U.S. tariffs.

6.3 Political Contributions

in progress

7 Conclusion

in progress

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Tables

TABLE 1: TARIFFS ON U.S. IMPORTS AND EXPORTS LEVIED IN 2018

Panel A: Tariffs on U.S. Imports Enacted by Presidential Proclamation in 2018

Tariff Wave	Date Enacted	Products	2017 Annual Imports		Statutory Tariff Rate (%)	
		(# HS10)	(mil USD)	(%)*	2017	2018
Solar Panels	Jan-Feb 2018	8	5,781	0.2	0.0	30.0
Washing Machines	Jan-Feb 2018	8	2,101	0.1	1.2	32.7
Aluminum	Mar-Jun 2018	65	17,623	0.7	2.0	11.9
Iron and Steel	Mar-Jun 2018	753	30,207	1.3	0.0	25.0
China	Jul-Sep 2018	11,162	246,904	10.3	3.0	26.2
Total		**11,996**	**302,616**	**12.6**	**2.6**	**25.4**

Panel B: Retaliatory Tariffs on U.S. Exports Enacted by Trading Partners in 2018

Retaliating Country	Date Enacted	Products	2017 Annual Exports		Statutory Tariff Rate (%)	
		(# HS10)	(mil USD)	(%)*	2017	2018
China	Apr-Sep 2018	1,421	60,305	3.9	8.3	41.3
European Union	Jun 2018	227	8,144	0.5	5.0	29.7
Mexico	Jun-Jul 2018	215	6,746	0.4	9.1	24.1
Turkey	Jun 2018	247	1,554	0.1	8.5	31.2
Canada	Jul 2018	328	17,818	1.2	1.6	21.1
Russia	Aug 2018	147	268	0.0	3.3	34.4
India	Nov 2018**	18	893	0.1	42.3	tbd
Total		**2,087**	**95,730**	**6.2**	**7.1**	**35.2**

Panel C: Value by Broad Sector and of Consumer Goods

All Tariff Waves	U.S. Tariffs			Retaliations		
	(# HS10)	(mil USD)	(%)*	(# HS10)	(mil USD)	(%)*
By Broad Sector						
Agriculture	1,877	5,655	0.2	2,038	26,069	1.7
Manufacturing	11,188	290,892	12.1	5,118	69,661	4.5
Consumer Goods						
Matches to CPI Code	1,433	55,141	2.3	2,037	28,433	1.8

*Denominator for import (export) share is the total 2017 annual USD value of all US imports (exports).
** The Indian government intitially announced retaliatory countermeasures in May, but has repeatedly delayed implementation.
Trade values obtained from the US Census Bureau. Targeted HS10 product codes and statutory tariff rates obtained from government documents and the World Trade Organization. Panels display unweighted monthly HS10-country average statutory tariff rates. 2018 rates computed using the post-tariff-increase period. Total tariff rates computed as the trade-weighted average of table values. Table is up-to-date as of September 2018.

TABLE 2: COMPARISON GROUP SUMMARY STATISTICS

Panel A: Comparison Groups for Tariffs on US Imports						
Tariff Wave	Solar	Washers	Alum	Steel	China	**Total***
Target						
Countries	59	45	69	68	1	
Varieties	217	168	1,830	11,170	1,546	**14,931**
Products	8	8	65	753	1,546	**2,380**
Value ($mil)	5,781	2,100	16,840	24,239	33,510	**82,470**
Exempt						
Countries	1	1	2	4	75	
Varieties	1	6	58	1,126	51,896	**53,087**
Products	1	6	42	626	1,665	**2,340**
Value ($mil)	0	2	783	5,968	435,964	**442,716**
Similar						
Countries	58	29	0	44	76	
Varieties	199	48	0	203	37,925	**38,375**
Products	5	3	0	9	1,226	**1,243**
Value ($mil)	637	4	0	228	321,216	**322,085**

Panel B: Comparison Groups for Tariffs on US Exports								
Retaliation Wave	Canada	China	EU	India	Mexico	Russia	Turkey	**Total***
Target								
Varieties	268	1,229	3,109	16	215	116	161	**5,114**
Products	268	1,229	227	16	215	116	161	**2,232**
Value ($mil)	14,313	30,732	5,962	26	6,000	220	259	**57,511**
Exempt								
Varieties	16,908	66,039	9,794	1,066	10,173	6,629	10,864	**121,473**
Products	328	1,421	227	18	215	147	247	**2,603**
Value ($mil)	32,120	355,376	31,812	18,930	22,069	12,457	71,403	**544,167**
Similar								
Varieties	11,720	91,282	18,865	710	3,909	9,416	5,252	**141,154**
Products	239	1,944	362	15	72	186	105	**2,923**
Value ($mil)	16,186	262,441	38,801	744	8,539	16,025	19,571	**362,308**

Products defined from HS10 codes. *Varieties* defined as HS10-country pairs. Totals do not sum to the values shown in Table 1, because Table 1 covers all tariff waves whereas the present table covers only those waves for which U.S. trade data is available (the Census publishes trade flow data with a two-month lag). Table is up-to-date as of July 2018.

TABLE 3: IMPORT DATA: PRODUCT-LEVEL OUTCOMES

	(1) Value	(2) Quantity	(3) Value/Quantity	(4) (Value+Duty)/Q	(5) # Varieties
Target × Post	-0.157***	-0.167***	0.026	0.047	-0.032**
	(0.040)	(0.064)	(0.044)	(0.044)	(0.013)
HS4 × Time FEs	yes	yes	yes	yes	yes
Variety FEs	yes	yes	yes	yes	yes
Adjusted R2	.9	.96	.97	.97	.97
N	208412	172235	172235	172235	208379

Regressions are run at the product level. A product is classified into one of two groups: target and similar (the leave out). Standard errors clustered by HS8. Sample period 2013/1-2018/7.

TABLE 4: EXPORT DATA: PRODUCT-LEVEL OUTCOMES

	(1) Value	(2) Quantity	(3) Value/Quantity	(4) (Value+Duty)/Q	(5) # Varieties
Target × Post	-0.081*	-0.056	-0.031	-0.031	-0.035*
	(0.043)	(0.052)	(0.023)	(0.023)	(0.019)
HS4 × Time FEs	yes	yes	yes	yes	yes
Variety FEs	yes	yes	yes	yes	yes
Adjusted R2	.91	.95	.98	.98	.97
N	266033	240353	240353	240353	265068

Regressions are run at the product level. A product is classified into one of two groups: target and similar (the leave out). Standard errors clustered by HS8. Sample period 2013/1-2018/7.

TABLE 5: IMPORT DATA: VARIETY-LEVEL OUTCOMES

	(1) Value	(2) Quantity	(3) Value/Quantity	(4) (Value+Duty)/Q
Target × Post	-0.131***	-0.154**	0.028	0.124***
	(0.040)	(0.067)	(0.044)	(0.036)
Exempt × Post	-0.061***	-0.087**	0.011	0.007
	(0.017)	(0.036)	(0.027)	(0.026)
Country × Time FEs	yes	yes	yes	yes
HS4 × Time FEs	yes	yes	yes	yes
Variety FEs	yes	yes	yes	yes
Adjusted R2	.8	.87	.89	.89
N	2360550	1657445	1657445	1657445

Regressions are run at the variety level. A variety is classified into one of three groups: target, exempt and similar (the leave out). Standard errors clustered by HS8. Sample period 2013/1-2018/7.

TABLE 6: EXPORT DATA: VARIETY-LEVEL OUTCOMES

	(1) Value	(2) Quantity	(3) Value/Quantity	(4) (Value+Duty)/Q
Target × Post	-0.100***	-0.135***	0.009	0.009
	(0.028)	(0.039)	(0.026)	(0.026)
Exempt × Post	0.010	0.024	-0.023	-0.023
	(0.019)	(0.024)	(0.018)	(0.018)
Country × Time FEs	yes	yes	yes	yes
HS4 × Time FEs	yes	yes	yes	yes
Variety FEs	yes	yes	yes	yes
Adjusted R2	.75	.87	.92	.92
N	4952310	3968659	3968659	3968659

Regressions are run at the variety level. A variety is classified into one of three groups: target, exempt and similar (the leave out). Standard errors clustered by HS8. Sample period 2013/1-2018/7.

TABLE 7: TARIFF RATE INCREASES WITHIN HS4 SECTORS

Panel A: U.S. Imports

	Maximum				
Minimum	10%	25%	30%	50%	Total
10%	7	0	0	0	7
20%	0	0	0	1	1
25%	0	159	1	0	160
Total	7	159	1	1	168

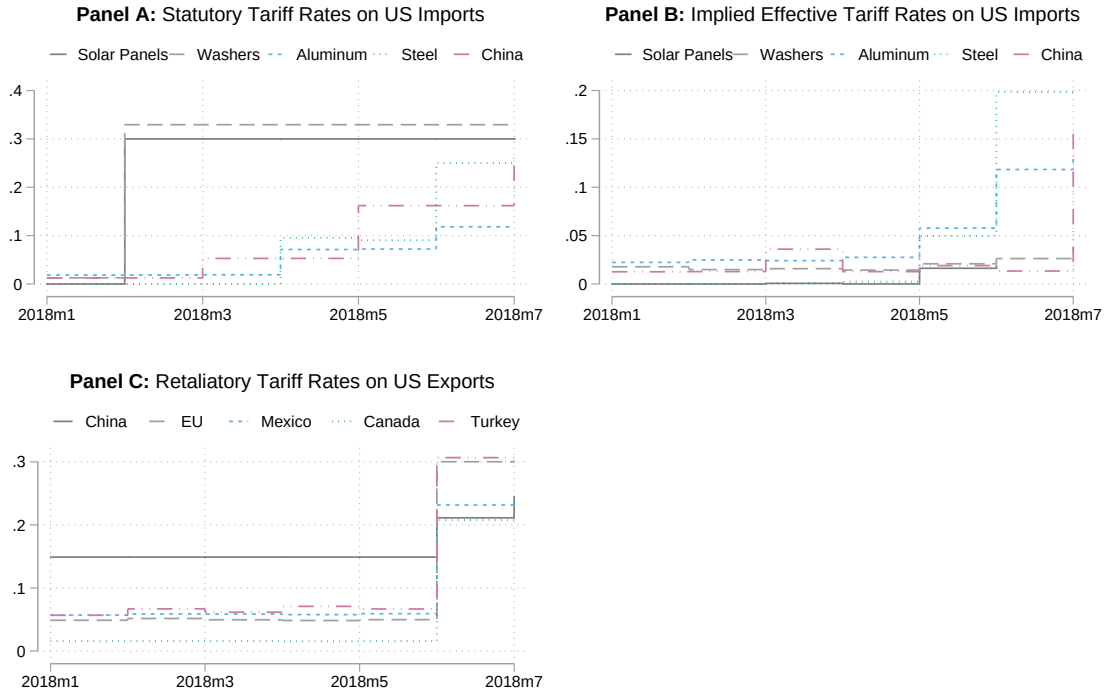
Panel B: U.S. Exports (Retaliations)

	Maximum			
Minimum	<10%	10-20%	20-30%	Total
<10%	29	3	17	49
10-20%	0	3	21	24
20-30%	0	0	75	75
Total	29	6	113	148

Tables show crosstabs of the minimum and maximum statutory tariff increase of products with the same HS2 sector.

Figures

FIGURE 1: TARIFF RATES ON U.S. IMPORTS AND EXPORTS



Panel A shows monthly statutory average *statutory* tariff rates on U.S. import varieties (HS10-country pairs), computed using data collected from legal documents issued by the USITC. Panel B shows monthly average implied *effective* tariff rates on U.S. import varieties, where the implied effective tariff rate is defined as *(Duty collected) / (CIF import value)* and computed using monthly trade data from the U.S. Census Bureau. Lagged increases in effective tariff rates for washing machines and solar panels reflect legal quota exemptions that must be surpassed before tariffs apply. Panel C shows *retaliatory* tariff rates imposed by foreign governments on U.S. exports, computed using data from documents issued by foreign finance ministries and the World Trade Organization. Retaliatory tariffs in Russia and India are excludeed as they are not yet implemented at the time of the most recent Census trade data release. All averages are unweighted and all data samples are restricted to varieties targeted for tariffs.

FIGURE 2: U.S. IMPORTS: EVENT-STUDY PRODUCT-LEVEL OUTCOMES

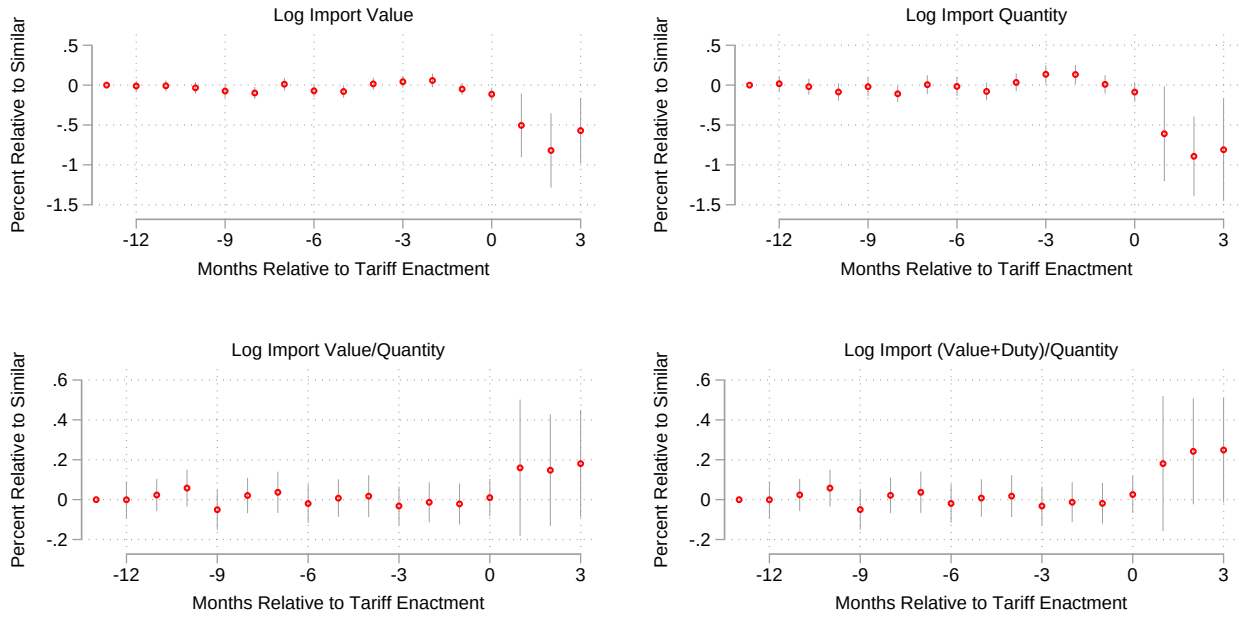


Figure plots event time dummies for target and exempt groups.
Event time prior to -12 are pooled together into a single dummy which is the leave-out time group.
Similar varieties are the leave-out group.
Regressions include FEs for HS4-time, country-time, and variety.
Sample period 2013/1-2018/7. Standard errors clustered by HS8 and error bars are 5% CIs.

FIGURE 3: U.S. EXPORTS: EVENT-STUDY PRODUCT-LEVEL OUTCOMES

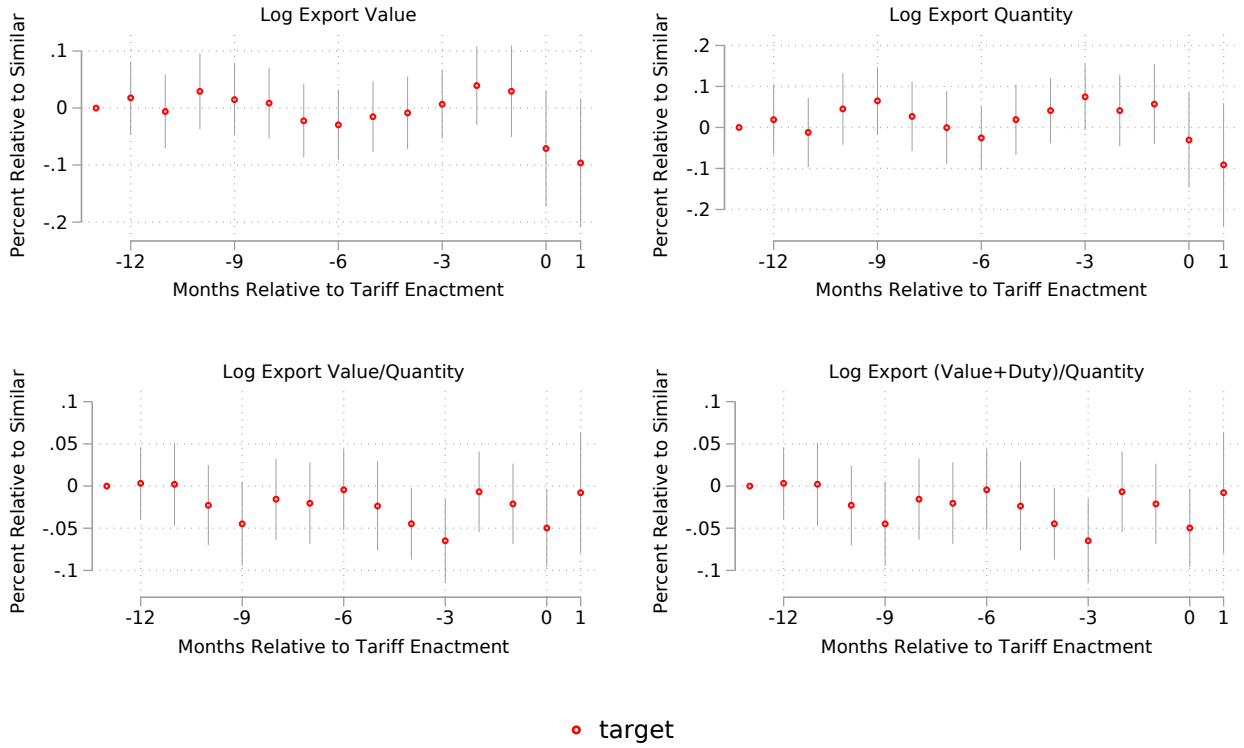


Figure plots event time dummies for target and exempt groups. Event time prior to -12 are pooled togeth
Regressions include FEs for HS4-time, country-time, and variety. Sample period 2013/1-2018/7. Standard

FIGURE 4: U.S. IMPORTS: EVENT-STUDY VARIETY-LEVEL OUTCOMES

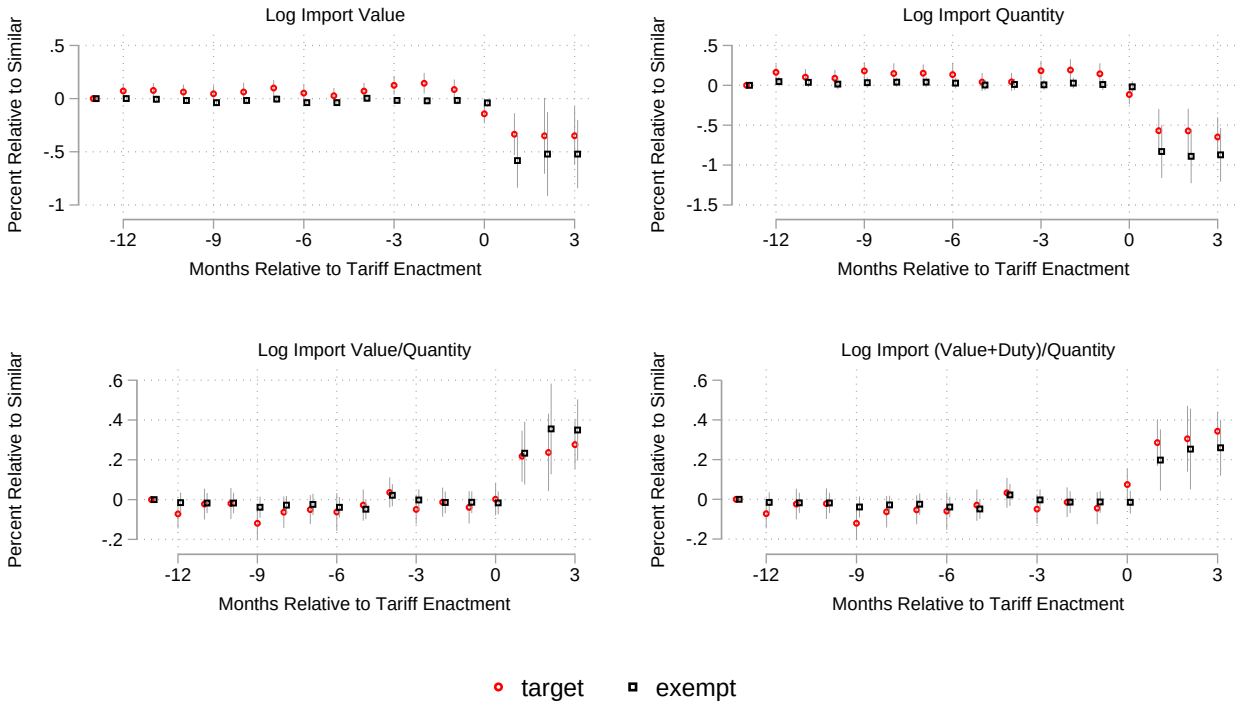


Figure plots event time dummies for target and exempt groups.
Event time prior to -12 are pooled together into a single dummy which is the leave-out time group.
Similar varieties are the leave-out group.
Regressions include FEs for HS4-time, country-time, and variety.
Sample period 2013/1-2018/7. Standard errors clustered by HS8 and error bars are 5% CIs.

FIGURE 5: U.S. EXPORTS: EVENT-STUDY VARIETY-LEVEL OUTCOMES

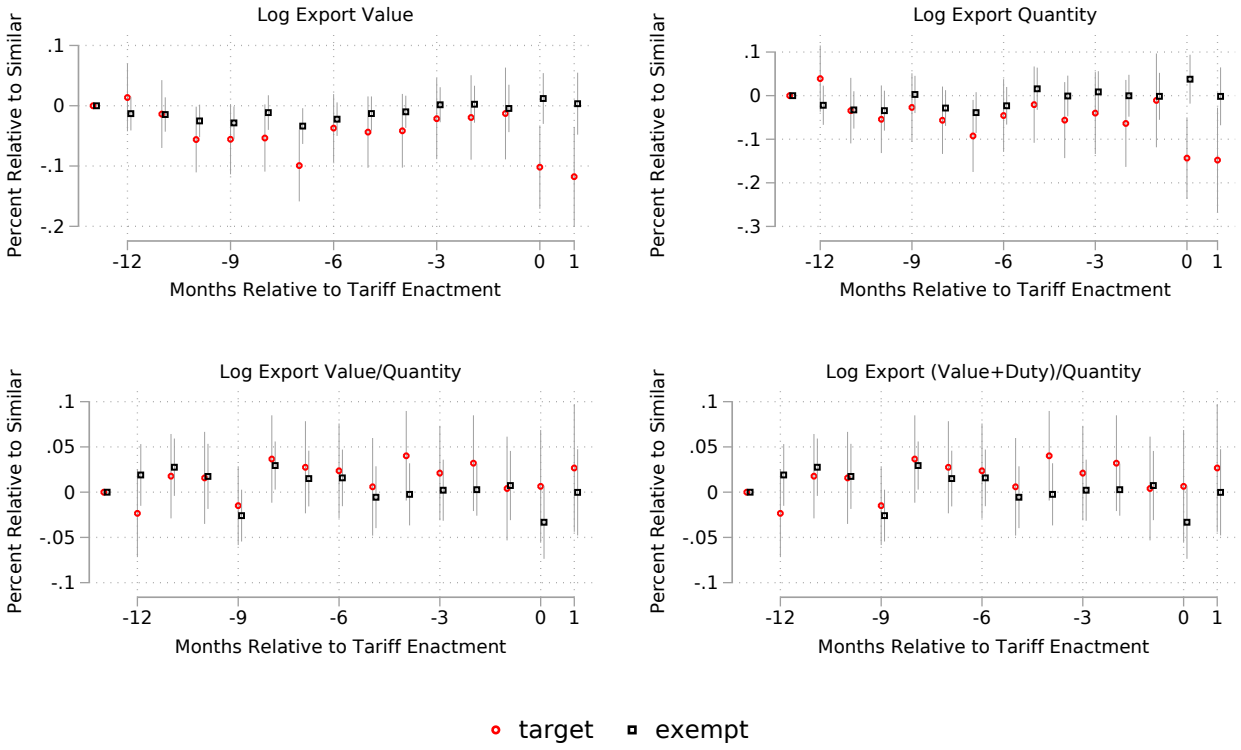
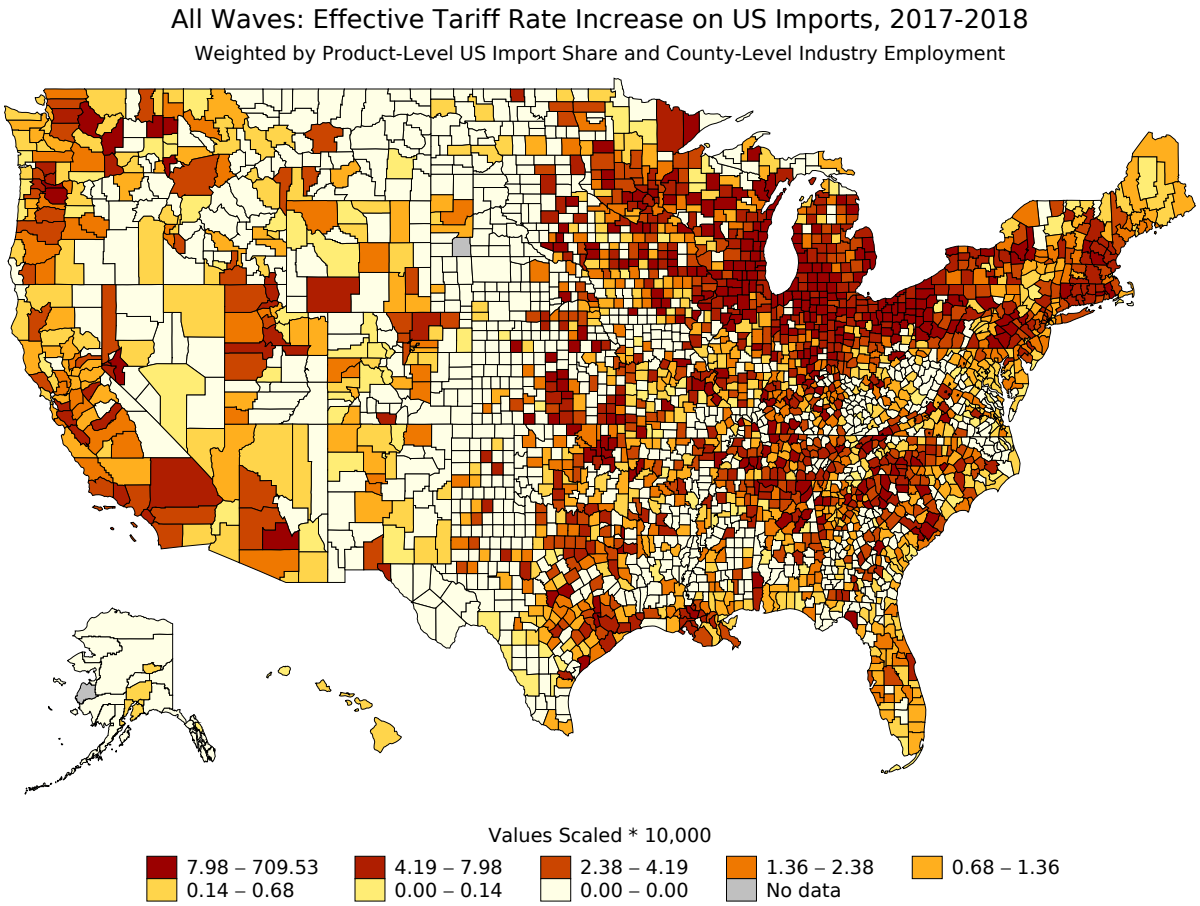


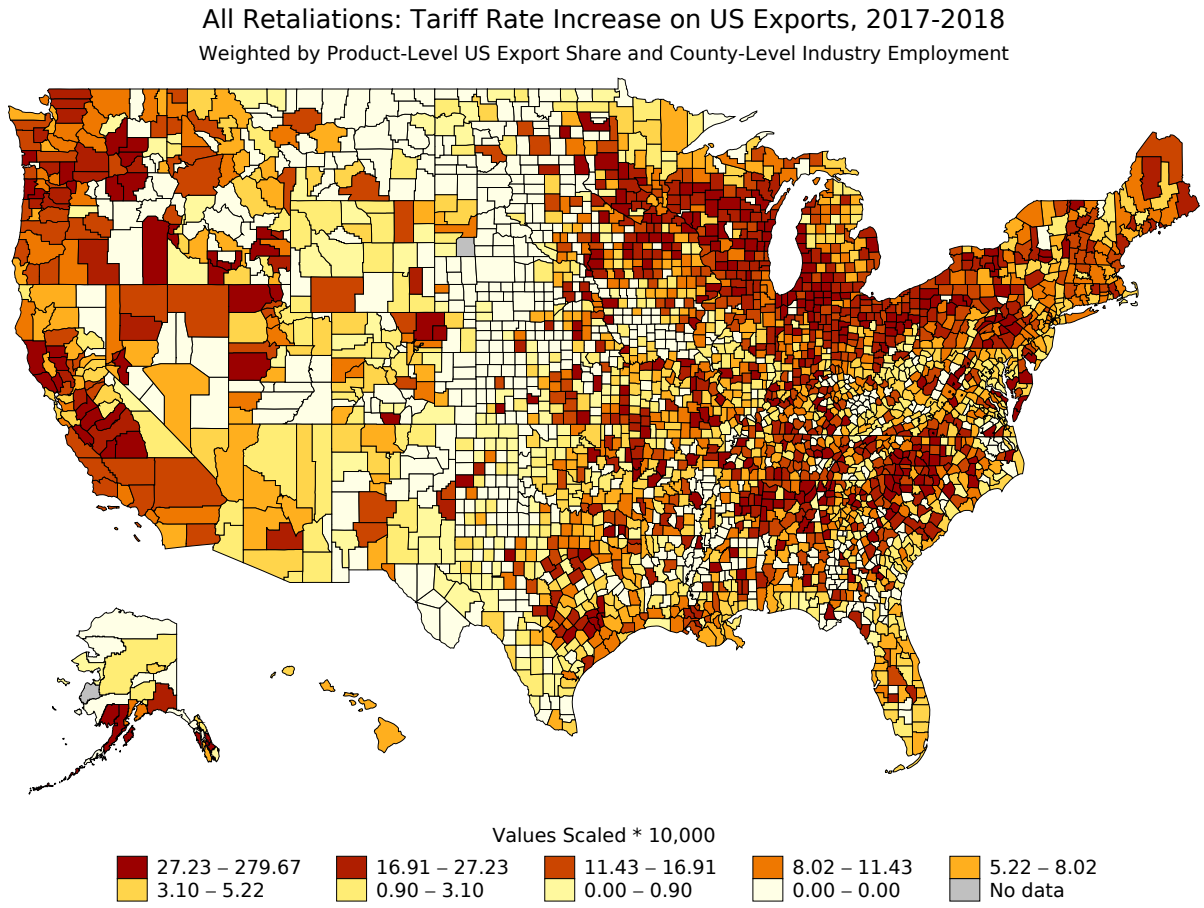
Figure plots event time dummies for target and exempt groups. Event time prior to -12 are pooled togeth
Regressions include FEs for HS4-time, country-time, and variety. Sample period 2013/1-2018/7. Standard

FIGURE 6: EMPLOYMENT-WEIGHTED INCIDENCE OF TARIFFS ON U.S. IMPORTS



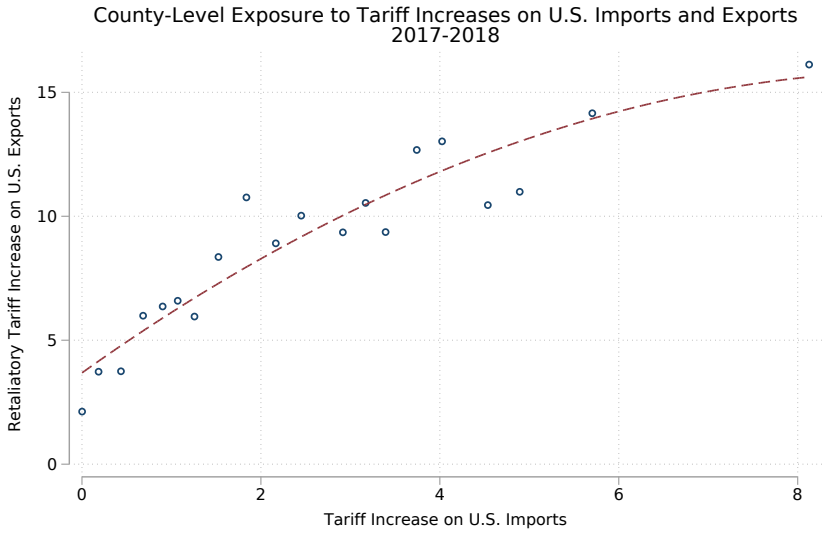
Map shows the employment-weighted exposure of U.S. counties to tariff increases on U.S. imports. To estimate county-level exposure, we compute, for each NAICS industry i, the 2017-2018 trade-weighted tariff rate increase, defined as $R_i = \sum^C$(foreign country c's tariff increase on US industry i products)$\times$(country c's share of US imports of industry i products). We also compute, for each US county j, the share s_{ji} of county j's workforce employed in each NAICS industry i. We then construct the county-level effective tariff rate as $\tau_j = \sum^I R_i \times s_{ji}$.

FIGURE 7: EMPLOYMENT-WEIGHTED INCIDENCE OF RETALIATORY TARIFFS ON U.S. EXPORTS



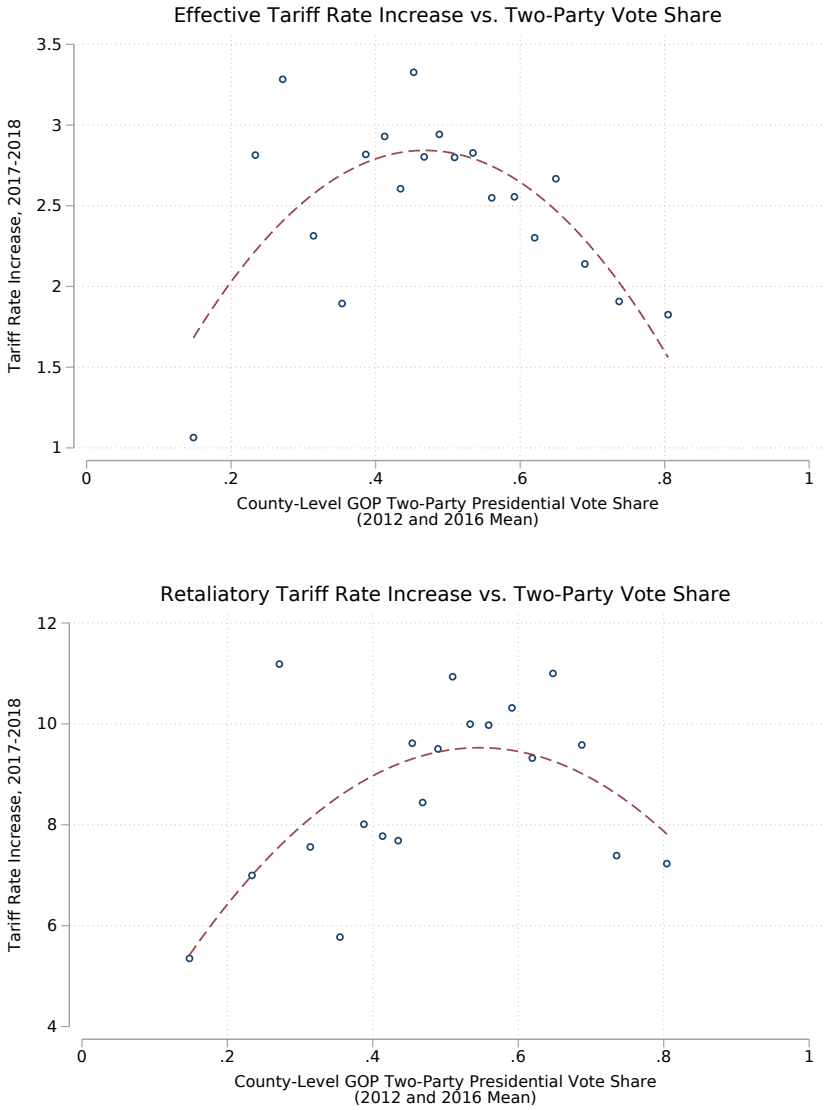
Map shows the employment-weighted exposure of U.S. counties to retaliatory tariff increases. To estimate county-level tariff exposure, we compute, for each NAICS industry i, the 2017-2018 trade-weighted tariff rate increase, defined as $R_i = \sum^C$(foreign country c's tariff rate on US industry i products)$\times$(country c's share of US exports of industry i products). We also compute, for each US county j, the share s_{ji} of county j's workforce employed in each NAICS industry i. We then construct the county-level retaliatory tariff rate as $\tau_j = \sum^I R_i \times s_{ji}$.

FIGURE 8: COUNTY-LEVEL EXPOSURE TO TARIFF INCREASES ON U.S. IMPORTS AND EXPORTS



Binscatter of all U.S. counties, weighted by population.

FIGURE 9: COUNTY-LEVEL TARIFF EXPOSURE VS. TWO-PARTY VOTE SHARE



Binscatter of all U.S. counties, weighted by population. Presidential election data from the U.S. Federal Election Commission.