



The Uneven Effects of Chinese Tariffs[†]

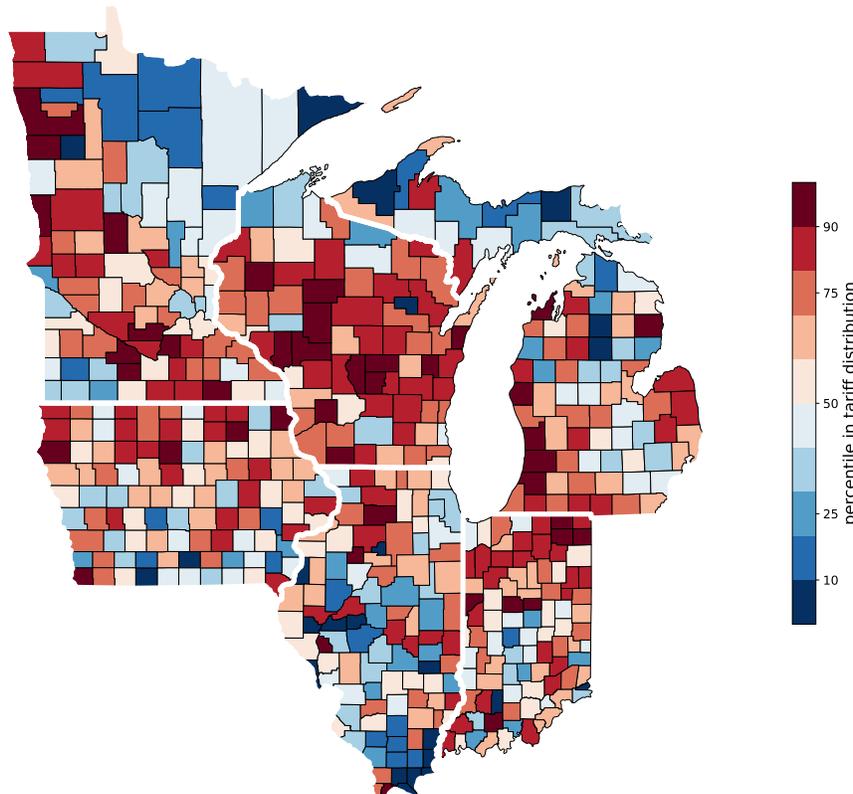
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As part of the escalating trade war, the Chinese government increased substantially the tariffs it levies on a range of products exported from the United States. Trade policy is applied at a national level—a good entering China from the United States is tarified the same regardless of where it was produced within the United States. The United States, however, is geographically diverse and the effects of the Chinese tariffs fall unevenly on different parts of the country. In early 2018, the United

Figure 1: Exposure to Chinese tariffs, December 2018.



States levied tariffs against solar panels, washing machines, steel and Aluminum—beginning the ongoing trade war. In July 2018, the United States raised tariffs on \$34 billion of Chinese goods and China retaliated by raising tariffs on \$34 billion of U.S. goods. August saw another round of

[†] Data briefs are short, timely reports that use data to highlight economic issues of importance to policy makers, business leaders, and the public. This brief, and the data and code that underlie it, are available at crowe.wisc.edu. The views expressed herein are those of the authors and not necessarily those of the Center for Research on the Wisconsin Economy, the Department of Economics, or the University of Wisconsin.

tariffs, with China raising tariffs on another \$34 billion of U.S. goods and September brought tariffs on an additional \$60 billion of U.S. products. By mid-2019, the average Chinese tariff on U.S. goods stood at 21 percent, up from about eight percent at the beginning of 2018. Bown and Kolb (2018) provide a detailed time line.

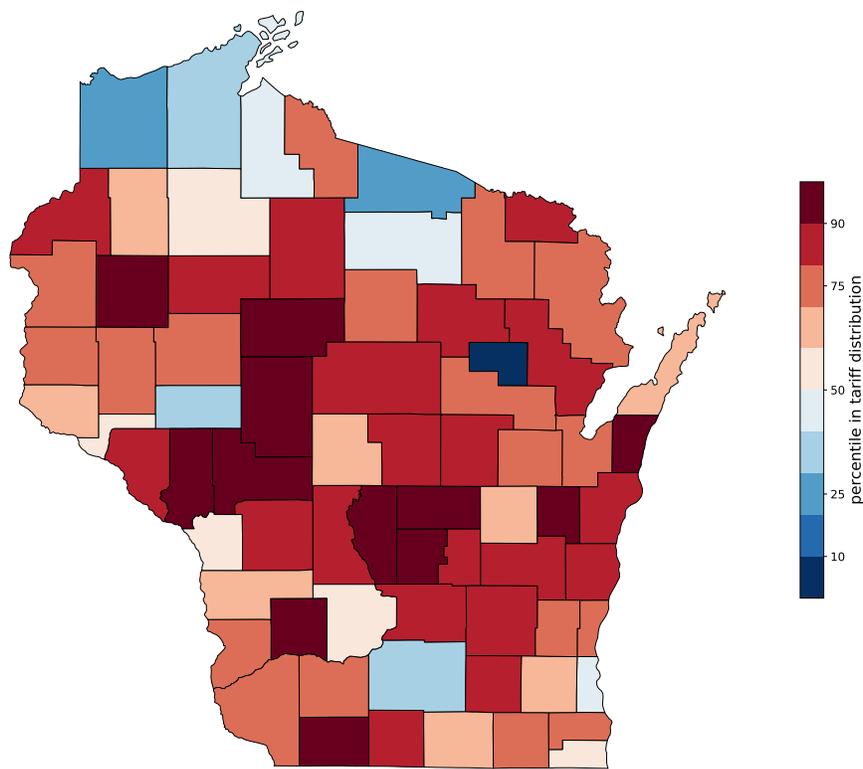
Tariff exposure

We begin by measuring a county's exposure to Chinese tariffs. We observe the Chinese tariff rate on U.S. goods for each three-digit NAICS commodity. Following Waugh (2019), for each county, we construct an employment-weighted average tariff. We use employment data from 2017 to avoid employment responses induced by the changing tariffs. Weighting by employment means that this measure captures the share of employment in each county that is exposed to Chinese trade policy.

We compute this tariff measure for December, 2018 and refer to it as a county's *exposure to Chinese tariffs*.¹ Next, we rank every county in the United States by its exposure to Chinese tariffs, group them into deciles, and plot the results for the upper Midwest in Figure 1. The ten-percent of counties with the lowest exposure to Chinese tariffs are dark blue. The ten-percent of counties with the highest exposure to Chinese tariffs are dark red.

Even within the region, there is significant heterogeneity. Southern Illinois is largely unaffected, as is northern Minnesota and Michigan; There are pockets of dark red in southwest Michigan and northern Indiana. Wisconsin, however, stands out: It consists largely of counties in the upper half of the distribution.

Figure 2: Exposure to Chinese tariffs, December 2018



¹Prior to 2017, Chinese tariffs on U.S. goods are zero, so the exposure measure in 2018 can also be interpreted as the change in exposure to Chinese tariffs.

In Wisconsin (Figure 2), the urban centers in Dane and Milwaukee counties are relatively unexposed, while 12 of the 72 counties are in the top decile of tariff exposure. These most-exposed counties make up about five percent of the state's population and are predominately rural. This is not surprising, given that a focus of the Chinese retaliatory tariffs is agriculture. We take a closer look at these counties below.

From tariffs to trade

While China is Wisconsin's third largest export market (behind Canada and Mexico), it represents a relatively small share of Wisconsin exports. The U.S. Trade Representative estimates that the Wisconsin economy exported \$22.7 billion of goods in 2018, about seven percent of which were destined for China (U.S. Trade Representative, 2019). Our methodology also attributes about seven percent of total Wisconsin exports to Chinese markets. At the county level, the median county sends 7.5 percent of its total exports to China. The twenty-fifth-percentile county's export share to China was 6.4 percent and the seventy-fifth-percentile county's share was 11 percent.

How have exports to China fared in the face of increased tariffs? We construct measures of average county-level exports to China for June 2017–June 2018 and July 2018–July 2019.² These periods are roughly one year before and after the tariff escalation in July 2018.

In Figure 3, we plot the change in exports (expressed in growth rates) to China over the two periods against the average Chinese tariffs in December 2018. Chinese exports have fallen in almost every county in Wisconsin. As expected—and as intended by the Chinese government—higher tariffs are associated with lower exports.

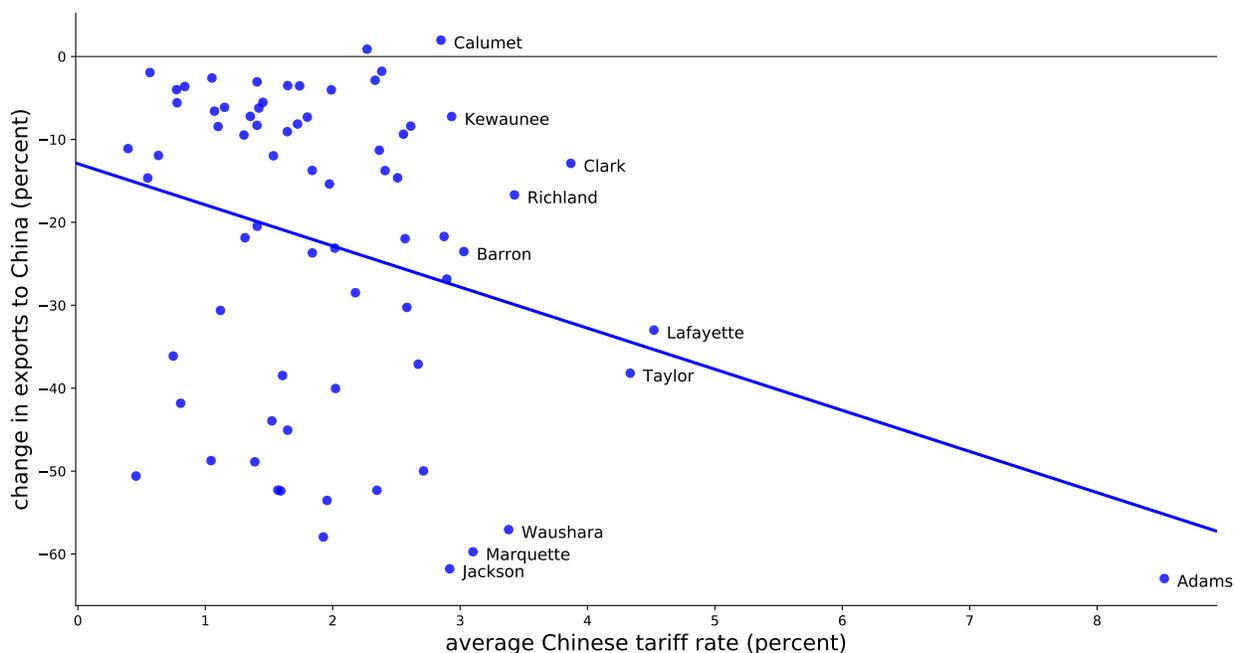
The twelve counties most exposed to Chinese tariffs are labeled in Figure 3. Adams county is most affected, both in terms of its exposure to Chinese tariffs and its change in Chinese exports. This is driven by the structure of the local economy. Businesses in Adams county export in two industries: *Crop production* (NAICS 111) and *Fabricated metal product manufacturing* (NAICS 332). Chinese tariffs on crops increased from zero percent to 25 percent and tariffs on metal products rose from zero percent to seven percent. The metal products industry is small in Adams county, making up less than one percent of employment in 2017. Crop production, however, is an important industry: More than one-third of the county's employment is in the crop-producing industry.

In Figure 4, we summarize the situation in the twelve most-exposed counties. The counties are ordered by their change in total exports to China. Of the twelve, exports from Adams fell the most (–62 percent) and exports from Calumet fell the least (+2 percent). The length of each bar represents the share of total labor in the county that works in the industry with the greatest exports to China. Next to each bar is the name of the industry and, in parentheses, the Chinese tariff in December 2018.

Three of the top four most-exposed counties are exporters of crops to China. Agriculture has been a focus of Chinese government's tariff strategy, as it seeks to weaken the Trump administration's political support in the midwest. All twelve counties in Figure 4 went for Trump in 2016. Food

²Data on exports to China by county do not exist. We follow Waugh (2019) in constructing county-level exports to China by apportioning total exports of a good by the county's share of national employment in the industry that produces the good. This measurement overstates Wisconsin's exports relative to the estimates produced by the U.S. Trade Representative by about 70 percent. The share of exports destined for China, however, match up closely with those of the U.S. Trade Representative. This imperfect measure gives us a window into the local effects of Chinese tariffs. We are continuing to work on better estimation methods.

Figure 3: Chinese exports and tariffs, Wisconsin counties



Notes: The vertical axis measures the growth rate of exports to China by county. The growth rate is computed from the average exports for the period June 2017–June 2018 and average exports for the period July 2018–July 2019.

manufacturing, which includes parts of the dairy industry, are also important industries in the affected counties, with tariffs rising to 14 percent. The machinery and metal manufacturing that is prevalent in the bottom half of the counties in Figure 4 tend to be smaller parts of the local economy and have seen tariffs rise less.

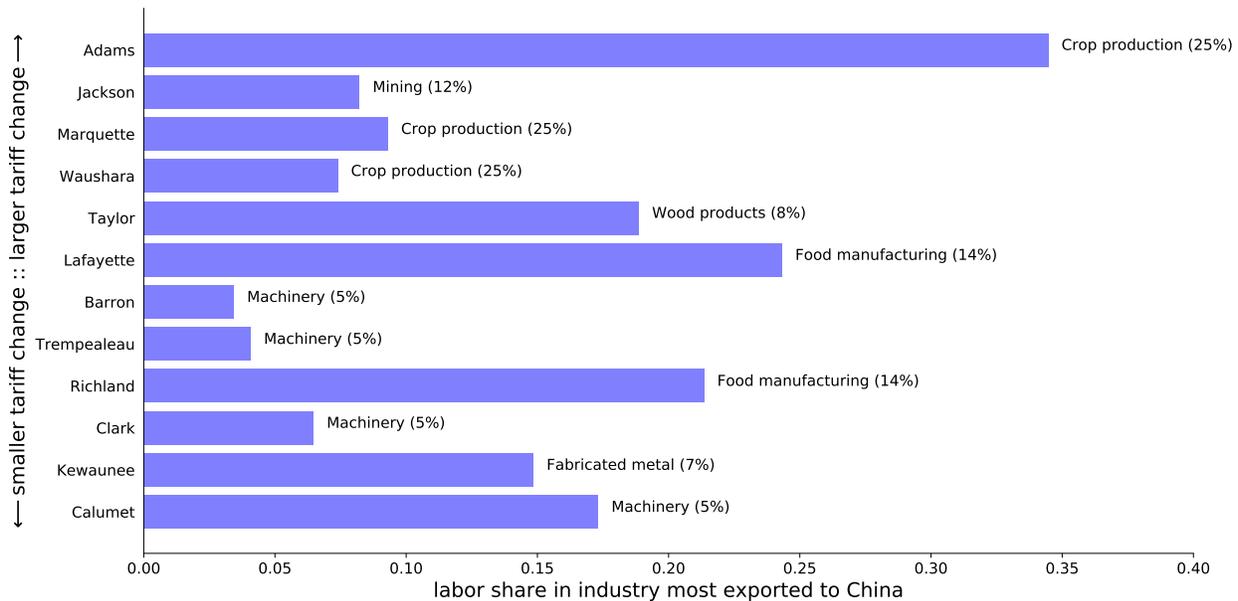
From trade to well-being

Chinese tariffs have had their expected affect on exports from the United States. To what extent have they affected the people living in the areas with falling exports? This is a difficult question to answer: Ideally, we would like to see consumption expenditure or income in counties at a monthly frequency so that we can make comparisons before and after the imposition of tariffs.³

Waugh, 2019 uses data on the purchases of automobiles—which is available by county on a monthly basis—to proxy for consumer behavior. Using data on every county in the United States, he finds that a one-percent increase in Chinese tariffs is associated with a 1.4 percent decrease in automobile sales. To the extent that this generalizes to overall consumption, this result implies significant heterogeneity in consumption across counties. Waugh finds similar effects on employment: A one-percent increase in Chinese tariffs is associated with a 0.4 percent decrease in employment in goods-producing sectors.

³If the trade war goes on long enough, we will eventually be able to use data at the annual frequency.

Figure 4: Counties with largest change in tariff



Notes: The length of each bar represents the share of total labor in the county that works in the industry with the greatest exports to China. Next to each bar is the name of the industry and, in parentheses, the Chinese tariff in December 2018.

Summary

Chinese retaliatory tariffs on the United States are levied at the national level, but the uneven pattern of production in the United States implies that the effects of these tariffs differ across localities. In Wisconsin, the counties most exposed to Chinese tariffs tend to be agricultural areas and they have seen significant declines in exports to China. Work by Waugh (2019) suggests that these tariffs are negatively affecting local employment and consumption.

References

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