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## **Selected Tariff Effects on Indiana**

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### **Introduction**

Beginning in January of 2018, the Trump Administration imposed graduated tariffs on solar panels and washing machines. In March 2018, the administration began a series of tariff announcements. The first of these affected steel and aluminum imports, of 25 percent and 10 percent respectively. Following significant stock market turbulence, plans to impose these tariffs were dropped. Notably, the Trade Act of 1974 authorized the president to impose tariffs under as retaliation, unfair trade practices or national security. The administration is deploying this legislation in its trade negotiations.

Since March, the Administration has revived some Aluminum tariffs, threatened more steel tariffs and added tariffs on more than 1,300 types of Chinese goods.<sup>1</sup> In April, May and June rhetorical threats of tariffs made daily news, but escalation by trading partners was limited to trade volumes that were similar to those imposed by the USA. Following the G-7 meeting, both China and G-7 partner nations have begun an escalation of tariff proposals, which culminate in a universal Chinese tariff proposed by the President on late June 19, 2018.

The changing landscape of tariff threats suggests that at least some tariffs and retaliation will affect the domestic economy in 2018 and beyond. The full scale and scope of tariff related effects are unknown. However, we can offer some modeling of two benchmark industries in Indiana. That modeling effort follows.

### **Selected Tariff Effects in Indiana**

Indiana employs roughly 22 percent of all steel workers in the United States, perhaps 13 percent of all automobile-related employment and produced \$6.2 billion in soybean and corn last year.<sup>2</sup>

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<sup>1</sup> See OFFICE OF THE UNITED STATES TRADE REPRESENTATIVE Docket No. USTR-2018-0005

<sup>2</sup> See, Bureau of Economic Analysis Regional Economic Information System for Manufacturing and USDA 2017 State Agriculture Overview for soybean and corn  
data.[https://www.nass.usda.gov/Quick\\_Stats/Ag\\_Overview/stateOverview.php?state=INDIANA](https://www.nass.usda.gov/Quick_Stats/Ag_Overview/stateOverview.php?state=INDIANA)

So, focusing on the potential effects of tariff restrictions on those two industries should frame the impacts of the first stage of this trade dispute.

To model these effects, we use the well know REMI, Inc. dynamic computable general equilibrium model, based on 23 sectors in Indiana. To develop the tariff related shocks to this model, we isolate the steel/aluminum and corn/soybean tariffs and focus on the magnitude of these preliminary shocks.

It is important in this context to understand the destination and value of US exports. Our largest trading partners are not surprisingly those that are closest and have the largest economies. See table 1.

<b>Table 1, Top 10 Indiana Export locations (millions 2017)</b> (source US Census Origin of Movement Series)					
Rank	Country	2014 Value	2015 Value	2016 Value	2017 Value
1	Canada	12,251	10,988	11,512	13,164
2	Mexico	5,138	4,917	4,889	5,064
3	China	1,437	1,265	1,753	2,068
4	Japan	1,644	1,697	1,656	1,693
5	France	1,354	1,478	1,218	1,557
6	Germany	1,625	1,436	1,781	1,546
7	Italy	839	1,124	1,192	1,357
8	United Kingdom	1,197	1,238	1,419	1,158
9	Netherlands	844	958	924	1,045
10	Ireland	604	916	444	971

In 2017, Indiana directly exported \$37.7 billion or roughly 10.5 percent of all goods produced in the state. The quality of data on agricultural exports is worse than that for finished goods, but some estimates have Indiana’s soybean exports as well over half of state production.<sup>3</sup> Indiana may be the single most tariff-exposed state with regard to the current round of tariffs.

To isolate the impact on Indiana, we start first with analysis performed by Francois and Baughman (2001, 2018). This analysis modeled the Steel Revitalization Act of 2001, with contemporary scale effects of tariffs. Among the critics of this, are Scott, 2018 who argues that the 2018 estimates inappropriately model the elasticity of demand for goods. To account for this, we use the lower range estimated job impacts, for steel only, applied to Indiana’s share of national steel production. This provides a gain of roughly 825 jobs as steel production increases due to market shifts to the USA. This is a conservative assumption, since the current unemployment rate in Indiana is 3.2 percent, thus expansion of steel employment at this level is likely constrained by labor availability in the short run. Those employment gains are offset by a loss of 2,472 manufacturing jobs among industries that use steel as an input. The net results is a loss of some 1,647 manufacturing jobs in Indiana.

<sup>3</sup> <https://www.farmflavor.com/indiana/indiana-agribusiness/indiana-exports-give-global-diversity/>

Other studies suggest the scale of job losses is likely in this range. Steil and Della Rocca (2018) have net negative job impacts nationally at more than 40,000, which is more than three times the Francois and Baughman estimates. Importantly, I scaled the Indiana impacts to the state's share of employment in auto manufacturing. However, work by Kolko (2018) suggests that Indiana may have the highest exposure share of job losses due to steel tariff since it has the highest share of jobs that use steel as an import. Moreover, estimates by Federal Reserve economists suggest even higher potential effects (Amiti, et. al. 2018). My estimates of job losses should be viewed as a lower bound, because both the gains in steel are generous and the losses in steel-users are conservative. We wish not to overstate the impact of tariffs, but merely present a plausible lower-bound scale of impacts.

Turning to the commodities of soybean and corn offered more ready analytical options. Indiana produces \$3.2 billion corn and \$3.06 billion of soybeans (USDA, 2018). As farmers have mostly planted their crops, the supply elasticity is nearly zero. Estimates of export elasticities to China are roughly 0.46 for corn and 0.61 for soybeans (Reimer, Zheng and Gehlhar, 2012). While export shares are modest, the traditional economic theory would suggest that tax incidence of this nature would be borne by the trading partner with the lowest relative elasticity. This is clearly the producer, and evidence of this effect have been recent declines in Soybean prices.<sup>4</sup> However, to be conservative in our estimates, we apply the export elasticities to both corn and soybeans, suggesting a roughly 11.5 percent decline in commodity prices for Indiana farmers (using the smaller of these two elasticities as measured by Reimer, Zheng and Gehlhar, 2012). This is conservative, given the near zero elasticity of supply. Moreover, given the premium for non-US commodities at the time of this writing, this is likely beneath the realized prices for most farmers on the spot market this year.<sup>5</sup>

To summarize, this modeling approach uses estimated job effects from earlier studies, and derive price effects from the lower bound elasticity estimates of corn and soybean demand. Both of these approaches are informally bolstered by other estimates of employment and pricing estimates. In representing these effects the goal is to focus on a plausible lower bound of impacts.

These two estimates permit us to apply these magnitudes to the Indiana economy. Again, using the REMI, Inc., dynamic CGE model, we can approximate both the immediate effect of these tariffs and the market adjustment to prices. This model estimates initial job losses in Indiana of roughly 6,000 (in 2018), rising to 14,000 in 2019, and declining through 2025 to just under 11,000 jobs. The GDP effect ranges from a loss of \$668,000,000 in 2019 to \$560,000,000 by 2025.

The GDP effects range from roughly 0.23 percent of the state's economy to 0.17 percent by 2025 as farmers and manufacturing firms adjust their production mix away from goods subject to

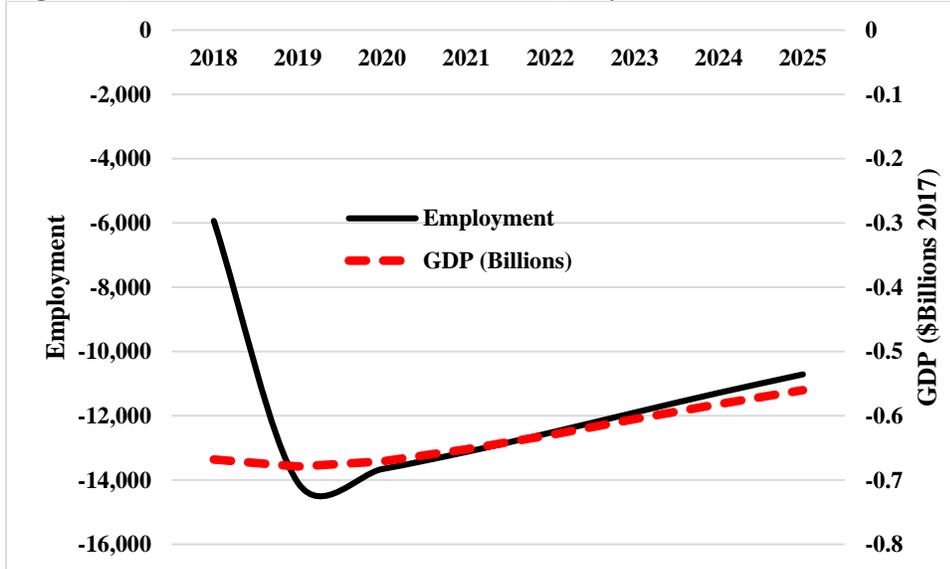
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<sup>4</sup> See Schafer, Sara "The Severe Implications of Soybean Tariffs" April 10, 2018 Ag Web <https://www.agweb.com/article/the-severe-implications-of-soybean-tariffs/>

<sup>5</sup> Reuters reports the premium on non-US Soybeans is 15%, which is well within the range of the estimates provided here. <https://www.agriculture.com/markets/newswire/grains-soybean-prices-edge-up-after-hitting-10-yr-low-on-us-china-trade-war-0>

tariffs. The employment effects peak in 2019 with a loss of about 0.4 percent of total employment. The graphical effects appear in Figure 1.

**Figure 1, Tariff Effects on Indiana (Steel, Soybean and Corn) 2018-2025**



## Summary

This policy brief provides a rough estimate of the economic and employment effects in Indiana of the proposed tariffs on steel and aluminum and the soybean and corn retaliation. Using very conservative estimates of the total employment and price effects, this suggests small, but meaningfully damaging effects to the Indiana economy, which will begin to manifest themselves over the coming weeks. These estimates do not suggest these tariff levels are sufficient to generate a business cycle, but are sufficient to reduce employment by 0.4 percent from where it would have been by mid-2019 and reduce GDP by some \$670 million, or roughly 0.23 percent by the end of next year. This is relatively large, as it comprises about 10 percent of all GDP growth expected for 2018-19. This also more than erases all the benefits of the Tax Cut and Jobs Act as estimated by Hicks (2017)

However, as this study was prepared, the US is in the early stages of what appears to be a very rapid escalation in tariff proposals, affecting not only China, Mexico and Canada, but also the European Union and other G-7 nations. These include US threats to impose broad tariffs on EU and NAFTA nations, as well as a June 20<sup>th</sup> threat to impose tariffs on 100% of Chinese imports to the U.S. Retaliatory tariffs include Chinese tariffs on soybeans and corn evaluated here, as well as abroad set of tariffs imposed on the US by the European Union. These tariffs are more than sufficient to threaten the US economic recovery, which began in summer 2009. The full tariff regime threatened by the US, the EU, China and Canada are sufficient to move the economy into recession in late 2018 or 2019. Fortunately, given the very rapid adjustments to trade policy, the likelihood of any tariff proposal surviving for more than a few weeks is very low.

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