

# **Trade Diversion Effects from Global Tensions: Higher Than We Think**

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*The views expressed herein are those of the authors and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.*

# Motivation and Key Questions

- What is the impact of global trade tensions on countries with high trade exposure and supply linkages?
  - 2018 U.S./China trade tensions
  - *2014 U.S. Sanctions on Russia*
- Why look at Mexico?
  - Trade open economy with supply linkages
  - Exposure to key countries (U.S. and China)

# Contribution

## Unique industry-level dataset

- Quantifies input-output and supply linkages
- 258 industries versus cross-country coverage of 56 industries
- Nationally sourced input-output tables show higher trade diversion

## Recent Work

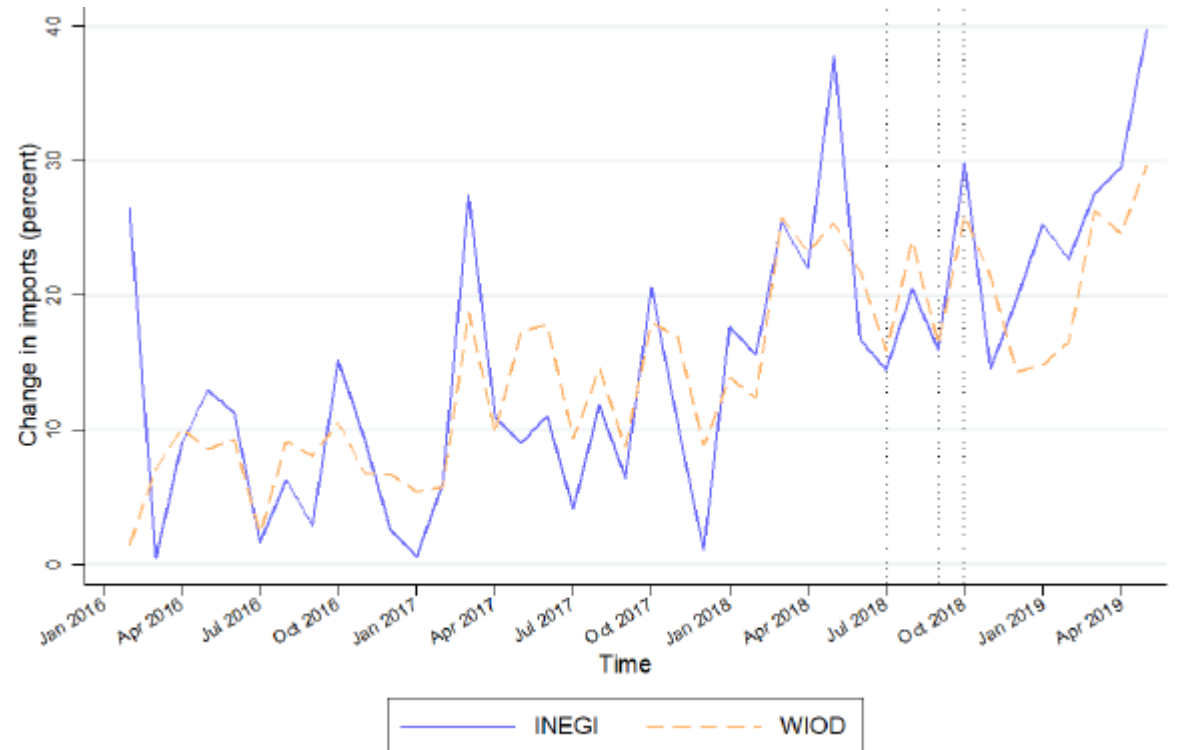
- Lovely et al. 2021; Utar et al. 2023
- Complements cross-country studies in 2023: Freund et al., Alfaro et al., Fajgelbaum et al.

# INEGI Compared to WIOD

Aggregate trade diversion effects from one standard deviation change in tariffs

Dynamic trade diversion effects

|            | (1)    |      | (2)    |      | (3)    |      | (4)    |      |
|------------|--------|------|--------|------|--------|------|--------|------|
|            | INEGI  | WIOD | INEGI  | WIOD | INEGI  | WIOD | INEGI  | WIOD |
| Output     | 7.2*** | 0.7  | 8.34** | 0.0  |        |      |        |      |
| Upstream   |        |      | -5.9   | 1.2  |        |      |        |      |
| Downstream |        |      | 2.0    | 0.2  |        |      |        |      |
| Total      |        |      |        |      | 6.2*** | 1.6  |        |      |
| Net        |        |      |        |      |        |      | 6.4*** | 1.4  |



Monthly data from January 2016 to May 2019

# Findings Preview:

## Trade Diversion Higher Than We Think

### Overall positive trade diversion

- A one standard deviation increase in net tariff change (5.8 ppt) on Chinese products increases Mexico's exports to U.S. by 6.4 percent
- Output tariffs play a more important role with some evidence on a positive impact through downstream tariffs

### Industry-level trade diversion effect

- *Correlated with:*
  - change in the U.S. imports from China
  - tariff imposed on China
  - product substitutability
  - [weakly] GVC integration
- *Not correlated with:*
  - Mexico's industry-level trade exposure to the U.S.

### 2014 U.S. sanctions on Russia

- 10 percent increase in Mexico's exports to the U.S. after four months

# The Dataset

- Input-output table of the Mexican economy from INEGI
  - 258 industries (NAICS 4-digit), 2003-2018
- Granular trade data (HS 6-digit) from UN Comtrade
- Cross-country input-output table from World Input-Output Database (WIOD)
  - 56 industries (ISIC 2-digit), 43 countries, 2003-2014

## **New information:**

- Detailed information on the sources of imported input for a specific industry
- Granular information on input-output linkages matched with trade data

# Information in the Dataset

For a specific industry (NAICS 4-digit), for example, *motor vehicle manufacturing industry*

## **Production:**

- Input structure (INEGI I/O table)
- How much inputs are imported (INEGI I/O table)
- Where to source inputs (Matched INEGI and WIOD/UN Comtrade)

## **Sales:**

- Where to sell products (WIOD/UN Comtrade)

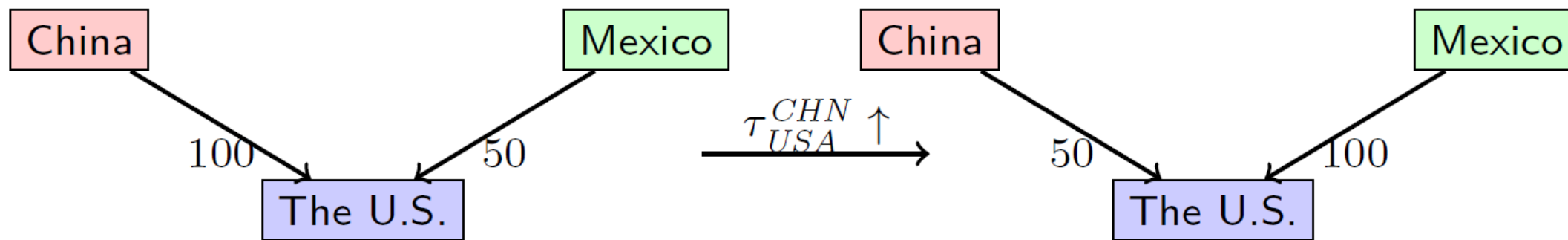
# 2018 U.S.-China Trade Tensions

- The focus of the paper is on the first three rounds of tariffs imposed by the U.S. on China
  - List 1. 25 percent duties covering \$34 billion imported products imposed on July 6, 2018
  - List 2. 25 percent duties on \$16 billion of imports, imposed on August 23, 2018
  - List 3. 10 percent tariff on \$200 billion of imports, enacted on September 24, 2018

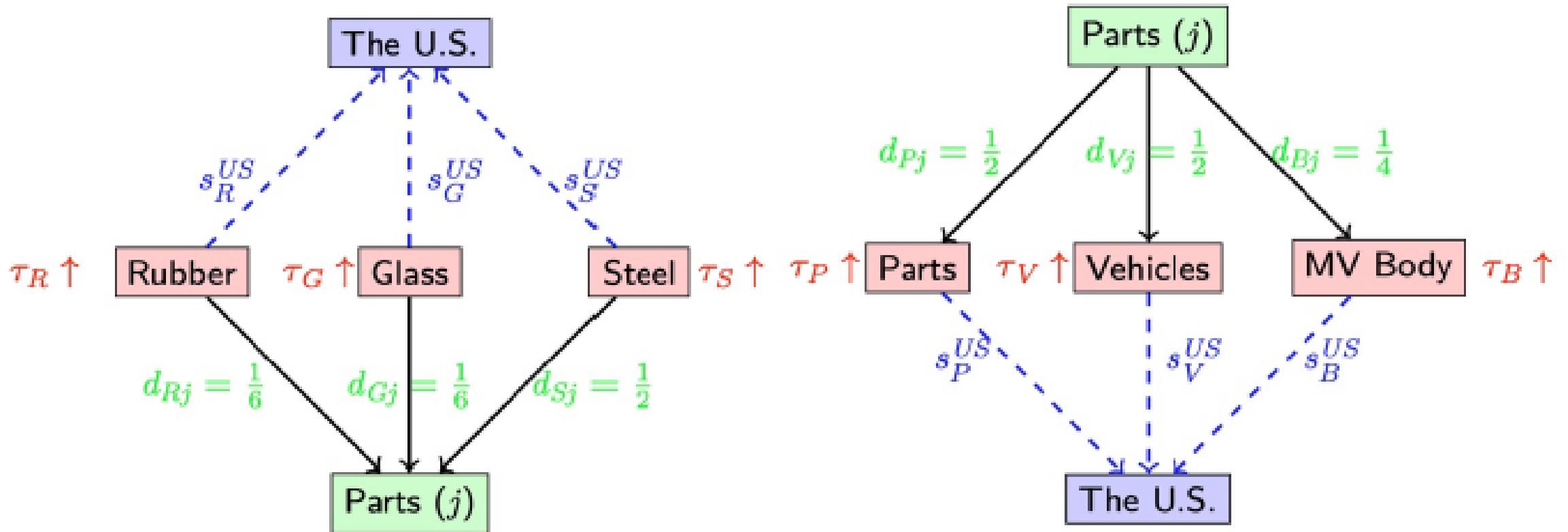


# Why Trade Diversion Occurs

## Direct Tariffs



# Upstream (left) and Downstream (right) Tariffs for Motor Vehicle Parts



# Empirical Methodology

**Data:** monthly industry-level Mexican exports value to the U.S.

## **Difference in differences**

- Aggregate trade diversion effect
- Diff. 1: Before-and-after tariffs were increased on Chinese products
- Diff. 2: Variation in tariff-change exposure across industries

## **Industry-level trade diversion effects**

- Heterogeneity in trade diversion across industries
- For each industry, estimate the change in export value to the U.S.
- Link the variation in export value change with exposure to tariff change

# Difference-in-Differences

$$Y_{j,t} = \alpha + \beta \Delta \tau_j \cdot Post_{j,t} + \rho Y_{j,t-1} + \eta_j + \xi_t + \epsilon_{j,t}$$

U.S. imports from Mexico  
(in log) in industry  $j$  in  
month  $t$ , 2016/01-2019/05

Treatment variable, the  
industry-level tariff change  
by the U.S. on Chinese  
products

Time dummy = 1 after tariff  
increases for industry  $j$

**Trade diversion effect**

# Trade Diversion: Mexico's Exports to the U.S.

Percent change in Mexico's exports to the U.S. in response  
to one standard deviation of tariff change

|            | (1)    | (2)    | (3)    | (4)    |
|------------|--------|--------|--------|--------|
| Output     | 7.2*** | 8.34** |        |        |
| Upstream   |        | -5.9   |        |        |
| Downstream |        | 2.0    |        |        |
| Total      |        |        | 6.2*** |        |
| Net        |        |        |        | 6.4*** |

- A one S.D. increase in net tariff change (5.8 p.p.) on Chinese products increases Mexican exports to the U.S. by 6.4 percent
- Effect of output tariff exposure is significantly positive and robust
- Some evidence for positive effect of downstream tariff but no pattern for upstream tariff

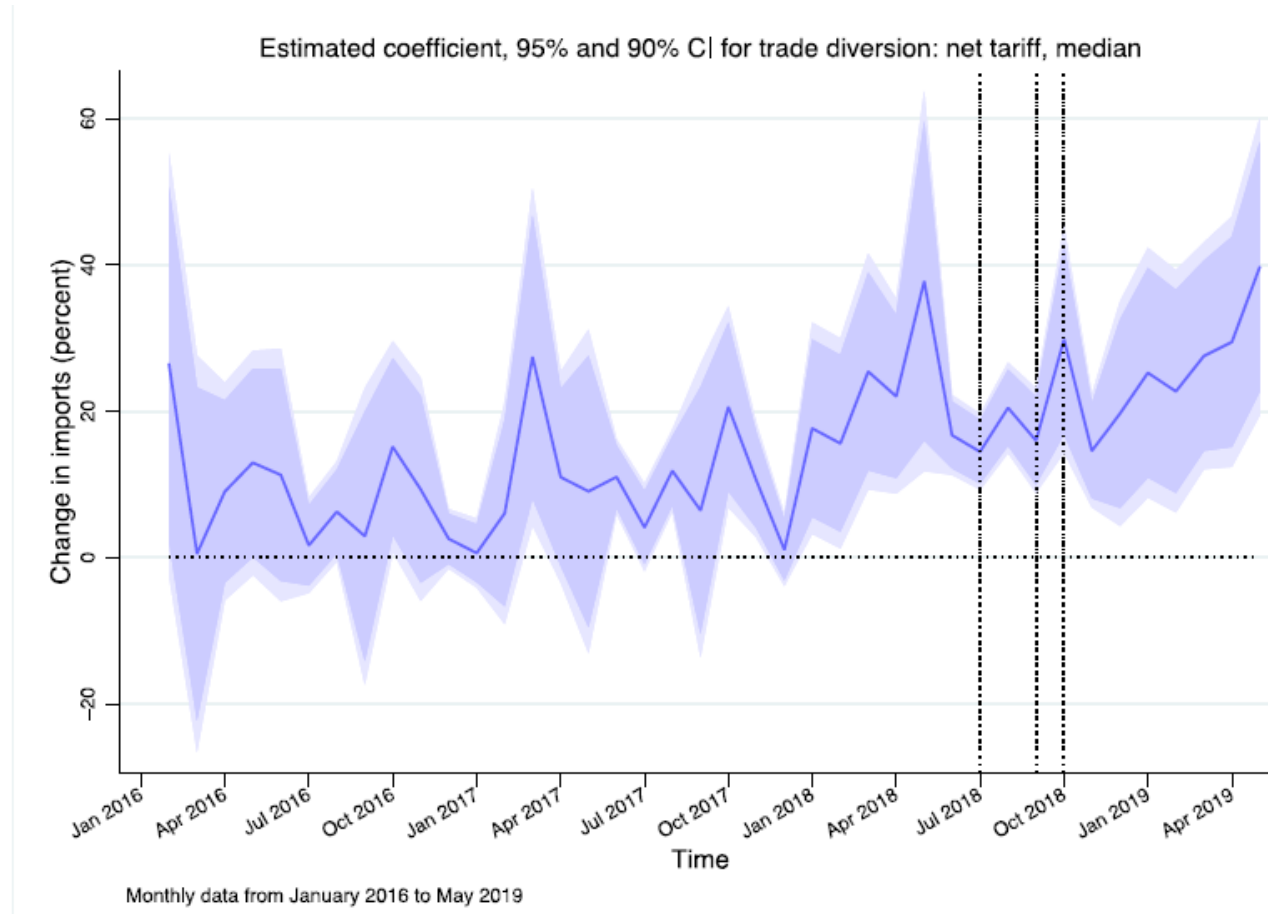
Total tariffs: Output + Downstream + Upstream

Net tariffs: Output + Downstream – Upstream

# The Impact of Tariffs on Mexico's Exports to the U.S.

|        | (1)                   | (2)              | (3)                 | (4)                 | (5)              | (6)                 | (7)                        | (8)               | (9)                 | (10)               | (11)                | (12)                |
|--------|-----------------------|------------------|---------------------|---------------------|------------------|---------------------|----------------------------|-------------------|---------------------|--------------------|---------------------|---------------------|
|        | 1( $\Delta\tau > 0$ ) |                  |                     |                     |                  |                     | 1( $\Delta\tau > median$ ) |                   |                     |                    |                     |                     |
| Output | 0.161***<br>(0.045)   |                  |                     | 0.158***<br>(0.049) |                  |                     | 0.161***<br>(0.045)        |                   |                     | 0.159**<br>(0.071) |                     |                     |
| Up     |                       | 0.851<br>(0.852) |                     | -0.000<br>(0.090)   |                  |                     |                            | -0.015<br>(0.126) |                     | -0.049<br>(0.120)  |                     |                     |
| Down   |                       |                  | 0.699***<br>(0.269) | 0.075<br>(0.137)    |                  |                     |                            |                   | 0.185***<br>(0.062) | 0.011<br>(0.100)   |                     |                     |
| Total  |                       |                  |                     |                     | 0.851<br>(0.852) |                     |                            |                   |                     |                    | 0.180***<br>(0.037) |                     |
| Net    |                       |                  |                     |                     |                  | 0.163***<br>(0.033) |                            |                   |                     |                    |                     | 0.174***<br>(0.035) |

# Time-varying Treatment Effect



# Industry-level Analysis

$$Y_{j,t} = \alpha_j + \beta_j Post_{j,t} + \rho_j Y_{j,t-1} + \gamma_j X_{j,t} + \epsilon_{j,t}$$

↓  
U.S. imports from Mexico  
(in log) in industry  $j$  in  
month  $t$ , 2016/01-2019/05

↘  
Time dummy = 1 after tariff  
increases for a particular  
industry

↓  
Control variables: growth  
and CPI of Mexico and the  
U.S., Mexican peso vis-à-vis  
dollar

↓  
**Trade diversion effect in  
a particular industry**



# Correlates of Industry-specific Trade Diversion Effect

| Industry characteristics                         | Correlation coefficient | p-value |
|--|-------------------------|---------|
| Change in U.S. imports from China                | -0.72                   | 0.00    |
| Net tariff change                                | 0.25                    | 0.02    |
| Output tariff change                             | 0.27                    | 0.01    |
| Export share to the U.S. in 2017                 | 0.01                    | 0.87    |
| Imported input value share in production in 2016 | 0.07                    | 0.30    |
| Export share in sales in 2016                    | 0.06                    | 0.32    |
| Product substitutability ( <i>s</i> )            | 0.23                    | 0.00    |

# Concluding Thoughts

- Positive trade diversion effects for Mexico's exports to the U.S., emanating mainly from output tariffs (and downstream tariffs)
- Results provide a good complement to recent cross-country studies—e.g., Freund et al. (2023)
  - China's decline in the U.S. exports was concentrated in tariffed goods
  - Mexico was one of the biggest winners
  - Evidence of nearshoring to Mexico
- Implications?
  - Geoeconomic fragmentation, short- versus long-term effects
  - Supply chains
  - Proper accounting of input-output data