An Overview of Trade Deficits and The Effects of Tariffs

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Dallas Fed
April 28, 2025

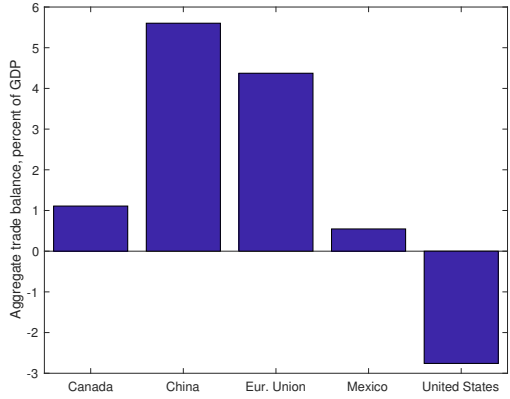
Roadmap

- Aggregate trade imbalances
- Bilateral trade imbalances
- Sectoral trade imbalances
- Factor content of production and trade
- State and industry level impacts of tariffs

Aggregate Trade Imbalances

Aggregate Trade Imbalances

The US runs a trade deficit; its main trading partners run surpluses



SOURCE: World Input-Output Database; Author's calculations

Aggregate Trade Imbalances

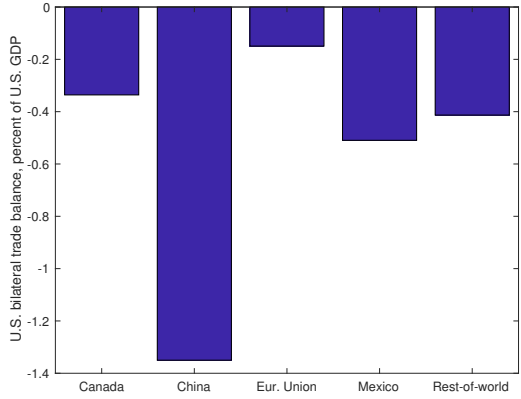
What is the meaning?

- The US trade deficit:
  - Imports exceed exports
  - Spending exceeds sales (income)
  - Saving exceeds investment
- How is a deficit financed?
  - International borrowing
  - Expend income earned on foreign asset holdings

Bilateral Trade Imbalances

Bilateral Trade Imbalances

US has bilateral deficits with its main trading partners



SOURCE: World Input-Output Database; Author's calculations

Bilateral Trade Imbalances

Traditional gross measures mask important information

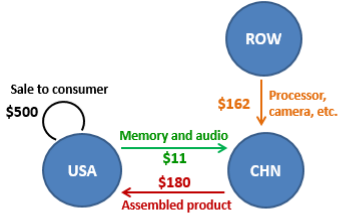
- Gross flows involve double counting of value added
- Example: China assembles an iPhone
  - Purchases materials for $173 - value added from other countries.
  - Assembles & exports the finished good for $180
  - China's gross output and gross export is $180, but value added is $7
  - China has *inflated* export figures - double count value of materials
- Distorted picture of bilateral trade linkages
  - Materials from Japan not counted as US imports from Japan
  - Bilateral trade balance with China is, in some sense, *overstated*

Bilateral Trade Imbalances

Measuring bilateral deficits using global value chains

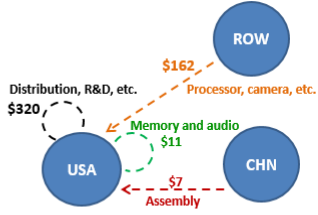
- Example: A US consumer purchases an iPhone for $500
- How does this affect the US-China bilateral trade balance?

Using gross flows



Implied **gross** trade deficit b/w U.S. and China: $169

Using value-added flows

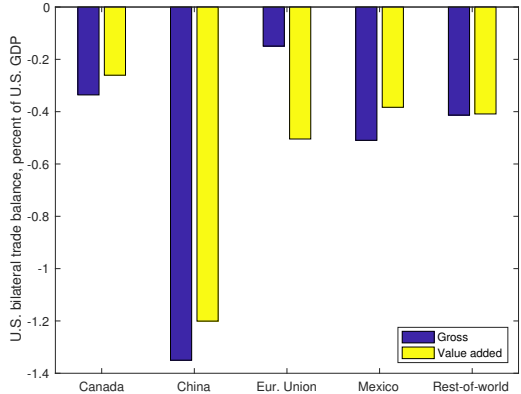


Implied **value-added** trade deficit b/w U.S. and China: $7

SOURCE: Sposi, M. and Janet Koech. "Value-Added Data Recast the US China Trade Deficit." Federal Reserve Bank of Dallas *Economic Letter*, July 2013, 8(5)

Bilateral Trade Imbalances

Reinterpret after accounting for global value chains.

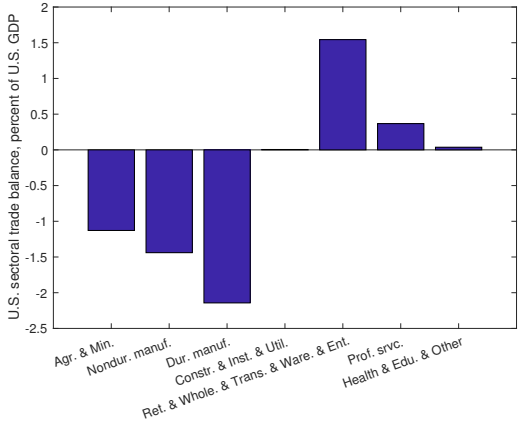


SOURCE: World Input-Output Database; Author's calculations

Sectoral Trade Imbalances

Sectoral Trade Imbalances

US has a deficits mostly in goods, and surpluses mostly in services



SOURCE: World Input-Output Database; Author's calculations

Sectoral Trade Imbalances

Traditional gross measures mask important information

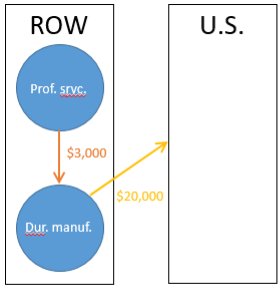
- Gross trade flows attribute all value to the *last* sector
- But previous stages of production embed value from other sectors
- Example: US imports a car
  - Counts as manufacturing import, say, $20,000
  - A large share of the car's value is produced by services, say, $3,000
  - E.g., software controlling anti-lock brakes on a car
- Distorted picture of sectoral trade
  - Services is embedded in vehicle, but not counted as trade in service
  - Imports of manufactured goods is, in some sense, *overstated*

Sectoral Trade Imbalances

Measuring sectoral deficits using global value chains

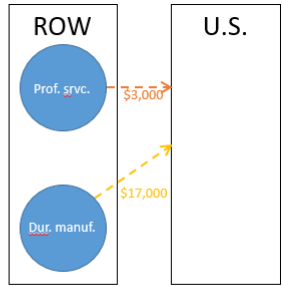
- Example: The US imports a $20,000 car
- How does this affect sector-level import data?

Using gross flows



Implied **gross imports** of $0 for professional services and $20,000 for durable manufactures.

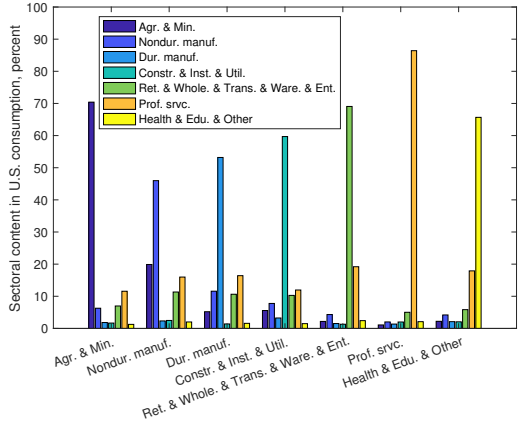
Using value-added flows



Implied **value-added imports** of $3,0000 for professional services and $17,000 for durable manufactures.

Sectoral Trade Imbalances

Professional services are heavily embedded in all sectors' output



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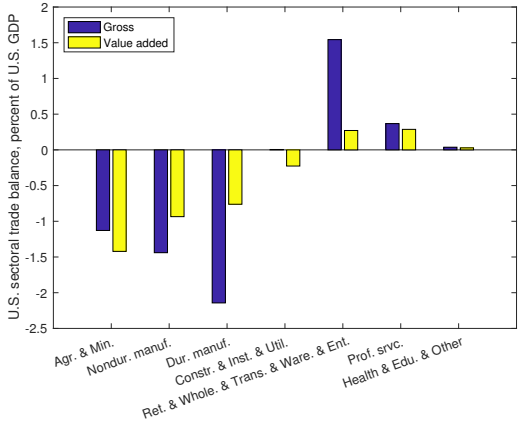
Sectoral Trade Imbalances

Reinterpret after accounting for inter-sectoral linkages.



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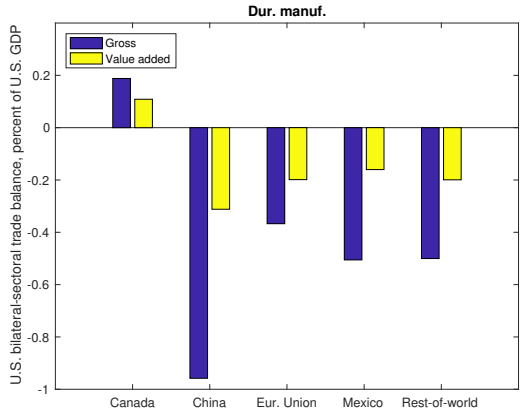

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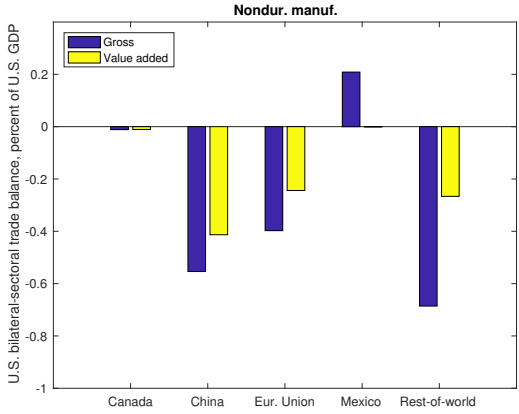

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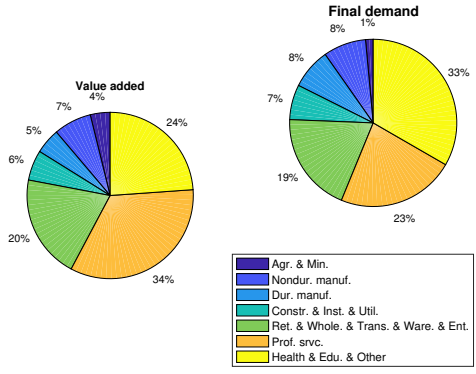
Factor Content of Production and Trade

Factor Content of Production and Trade

Value added shares are not the same as the final demand shares



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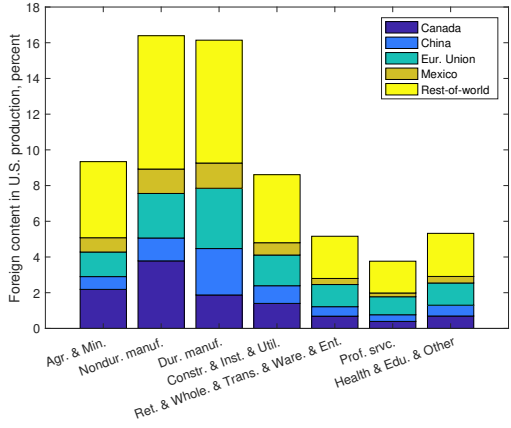
Factor Content of Production and Trade

How much foreign value is embedded in US production & exports?



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Factor Content of Production and Trade

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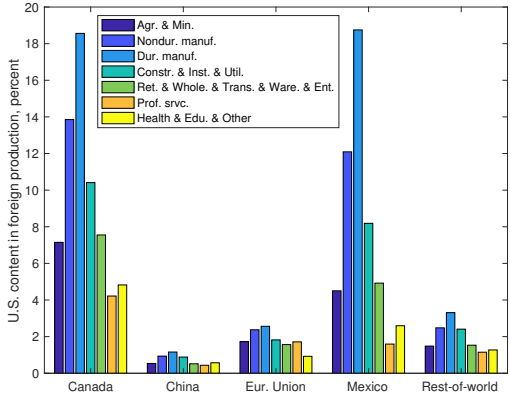


SOURCE: World Input-Output Database; Author's calculations

US Tariffs and the Trade War

Outline

- Aggregate trade-offs for trade policy
  - Prices
  - Income
  - Government revenue
- Winners and losers
  - Sector-level implications
  - State-level implications

Following analysis based on "What Determines State Heterogeneity in Response to US Tariff Changes?"
(by Ana Maria Santacreu, Michael Sposi, and Jing Zhang)

Disclaimer: The following views are those of the authors and do not necessarily reflect the views of the Federal Reserve Banks of Chicago, St. Louis, or the Federal Reserve System

Reminder
What is a Tariff?

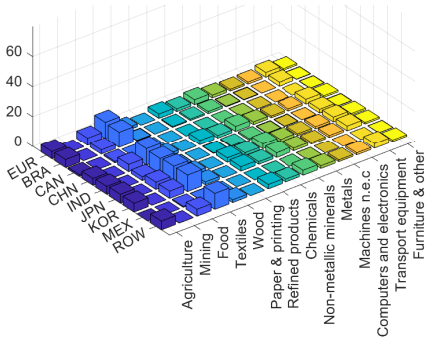
- A tariff is a sales tax applied to foreign-produced goods
- The duty is levied on the importer by the domestic government

- It is **not** directly paid by the exporter
- After the dust settles, incidence may be shared between the importer and the exporter
- Rules of origin:
  - Designed to account for supply chains within free trade zones (e.g., USMCA)
  - Prevent "side stepping" from outside of free trade zones

Ongoing Trade War

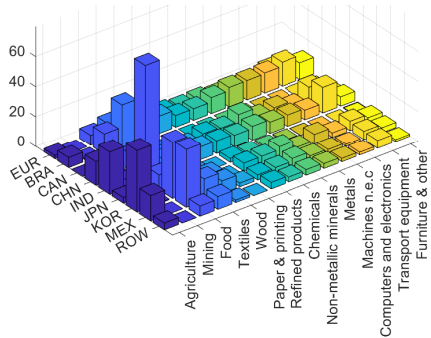
As of 2017

US-Imposed Tariffs



Average, 1.6%

Foreign-Imposed Tariffs on US

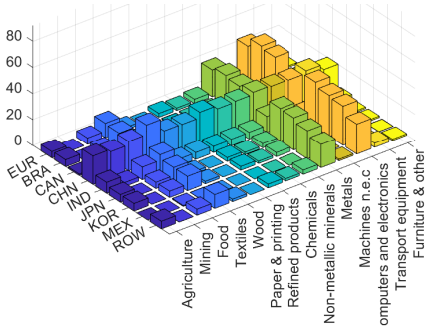


Average, 2.3%

Ongoing Trade War

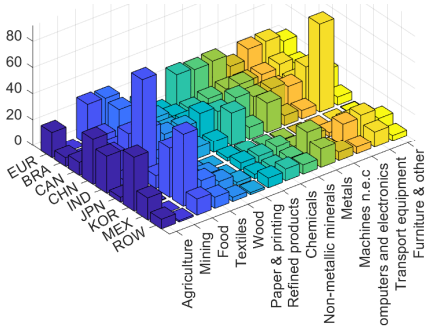
As of 2024

US-Imposed Tariffs



Average, 1.6% $\rightarrow$ 8.0%

Foreign-Imposed Tariffs on US

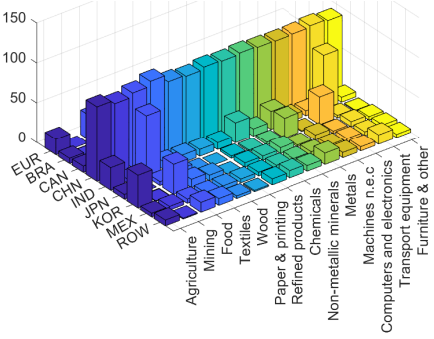


Average, 2.3% $\rightarrow$ 7.6%

Ongoing Trade War

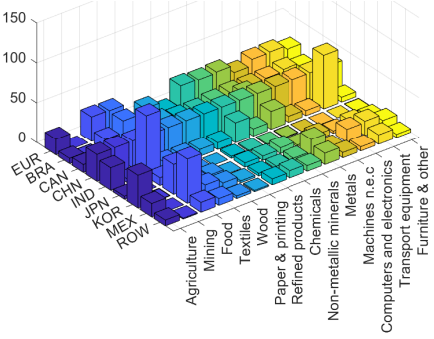
As of April 8, 2025

US-Imposed Tariffs



Average, 1.6% $\rightarrow$ 8.0% $\rightarrow$ 18.8%

Foreign-Imposed Tariffs on US



Average, 2.3% $\rightarrow$ 7.6% $\rightarrow$ 8.0%

Aggregate Trade-offs
Some Friendly National Accounting

$$P \times C = W \times L + T$$

- P – Price level
- C – Aggregate consumption
- W – Aggregate factor return (average wage)
- L – Employment
- T – Tariff revenue

Aggregate Trade-offs

Some Friendly National Accounting

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- P – Price level
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Since we ultimately care about quantities, let's use this:

$$C = \frac{W \times L}{P} + \frac{T}{P}$$

Let's evaluate the effects of the US unilaterally raising tariffs on all goods and all countries

Aggregate Trade-offs
General Mechanics

What happens as US unilaterally ↑ tariffs?

- P ↑
  - Magnitude depends on *pass-through*...
  - How *elastic* is import demand?
  - How *elastic* is export supply?
- US *terms of trade* improve
  - Each unit produced/exported results in more units imported/consumed

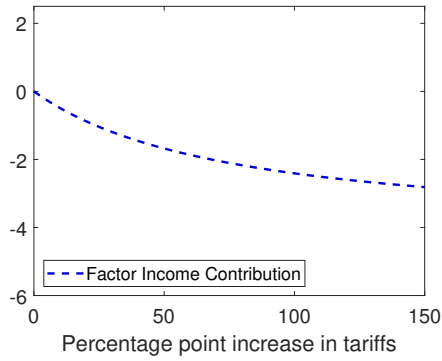
$$C = \frac{W \times L}{P} + \frac{T}{P}$$

Aggregate Trade-offs
General Mechanics

What happens as US unilaterally ↑ tariffs?

- $\frac{W \times L}{P} \downarrow$
  - Generally depends on specific policy

$$C = \frac{W \times L}{P} + \frac{T}{P}$$

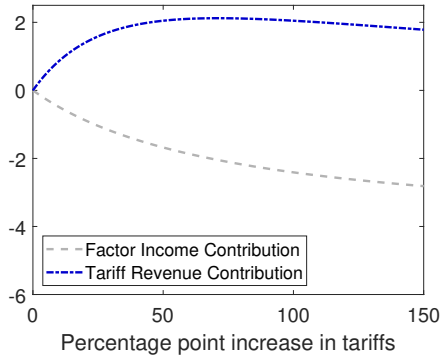


Aggregate Trade-offs
General Mechanics

What happens as US unilaterally ↑ tariffs?

- $\frac{T}{P}$ hump shaped
  - ↑ when tariffs are low
  - ↓ when tariffs are high
- 70% tariff increase maximizes revenue
  - revenue increases by 2% of GDP

$$C = \frac{W \times L}{P} + \frac{T}{P}$$

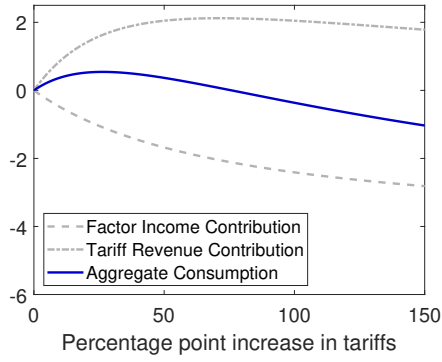


Aggregate Trade-offs
General Mechanics

What happens as US unilaterally ↑ tariffs?

- Effect on C is hump shaped
  - Balance between income and revenue
- 25% tariff increase maximizes C

$$C = \frac{W \times L}{P} + \frac{T}{P}$$

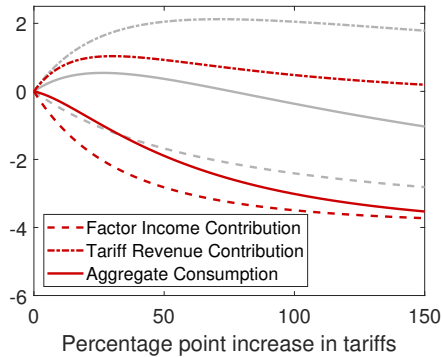


Aggregate Trade-offs
General Mechanics

What happens under tit-for-tat retaliation?

- $C \downarrow$
  - Deterioration in US terms of trade
- $\frac{W \times L}{P} \downarrow$
  - Exports, production $\downarrow$
- $\frac{T}{P}$ still hump shaped, but lower
  - Max revenue $\downarrow$ to 1.2% of GDP

$$C = \frac{W \times L}{P} + \frac{T}{P}$$



Heterogeneity

Sector-Level Winners and Losers

- Tariffs offer **protection** for the **least** internationally competitive sectors
- Tariffs **raise input costs** for the **most** internationally competitive sectors

Top 3 Winning Sectors

1. Textiles and apparel
2. Mining
3. Wood

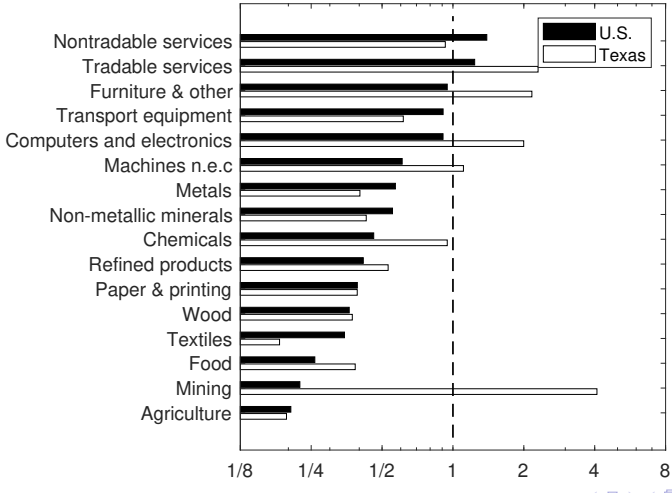
Top 3 Losing Sectors

1. Transportation equipment
2. Chemicals and pharmaceuticals
3. Computers, electronics and electrical equipment

Heterogeneity

International Competitiveness Index

Regions differ in productivity, worker skills, natural resources, geography



Heterogeneity

How are the effects distributed?

- Across sectors
- Across states

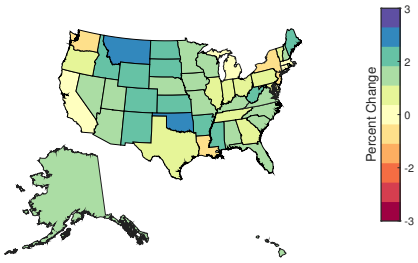
Let's consider a 25% increase in tariffs on all trading partners

Heterogeneity

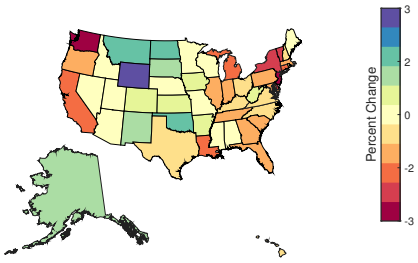
State-Level Winners and Losers

Percent Change in Consumption Following 25% increase in Tariffs

Without retaliation



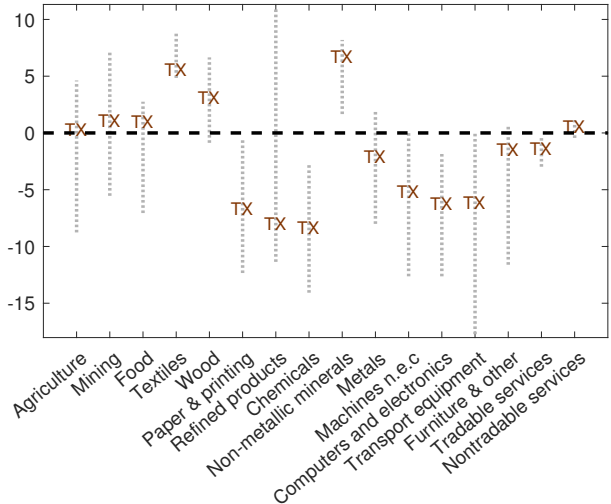
With tit-for-tat retaliation



	Texas	US	Canada	Mexico	Rest of World
Without retaliation	0.54	0.51	−1.75	−1.81	−0.20
With retaliation	−0.57	−0.94	−1.08	−1.61	−0.08

Heterogeneity

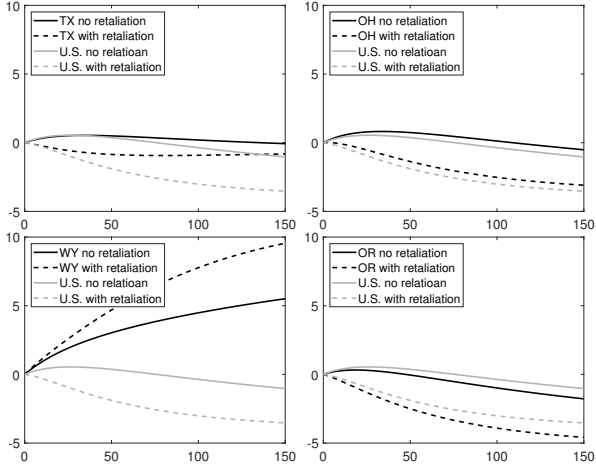
Within States and Sectors



Heterogeneity

State-Level Winners and Losers

What happens as the tariff rate changes?



Thank You

Coming Soon: "History of US Tariffs" In-Depth Dallas Fed Blog Post

Non-technical summary of the evolution of US trade policy with timely analysis

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