

Measuring Supply Chains

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How Better Statistics Lead to Better Policy in a Changing World
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Good and Bad

“The Great Supply Chain Disruption” is a wake up call.
But, we're not starting from scratch.

In the last decade:

- ▶ Big advances in analyzing supply chains as a conduit for shocks.
- ▶ Simultaneously, push to extend the input-output accounting architecture across borders – tracing out global value chains.
- ▶ Innovative use of value-added tax data and financial reports to map out domestic supply networks.

Nonetheless, all is not well.

- ▶ Huge gaps in US data on domestic supply chain linkages.
- ▶ Important blind spots in data on materials and import prices.

Holes in Domestic Data

We lose track of imports after they cross the border.

- ▶ Customs data tell us the direct importer, not who uses the inputs.
- ▶ Some imported inputs go through intermediaries (e.g., wholesalers).
- ▶ Imports flow downstream through the production chain.
 - ▶ Few firms import directly; Most are indirect importers.
 - ▶ e.g., imported rubber → US tires → US cars.
- ▶ Lateral exposure to import shocks is hidden from view:
e.g., imported semiconductors → US cars → US engine parts.

We don't know how exports are produced.

- ▶ Few firms export directly; Most are indirect exporters.
- ▶ e.g., US engine parts → exported US cars.

Mapping the *domestic* production network is critical for understanding exposures to *international* shocks.

Bottlenecks and Critical Inputs

Recent attention has focused on supply chain constraints.

Assessing robustness to shocks requires nailing the details.

For example, think about disruptions at US ports:

- ▶ What goods are coming through the port?
- ▶ Where are they shipped after clearing customs?
- ▶ What industries are they going to?
- ▶ What firms within each industry are using the imports?
How important are those particular inputs to the firm?
- ▶ What firms are exposed as buyers/suppliers to those firms?

Bottom line: policies to promote resilience rest on better data.

Data Infrastructure

The Gold Standard: value-added tax data.

- ▶ Firm-to-firm sales.
- ▶ Sometimes, invoices – values, quantities, products, etc.
- ▶ Belgium, Chile, Turkey, India, Cosa Rica, etc.

No VAT in US $\Rightarrow$ fragmented snapshots, hard to put big picture together.

What can the US do without a comparable data infrastructure?

- ▶ Enhance the econ. census (materials and production supplements).
- ▶ Invest in customs data, making more detailed data public.
- ▶ Renovate the Commodity Flow Survey (more than transportation).
- ▶ Strengthen and leverage financial reporting.
 - ▶ Currently, publicly listed firms must disclose major customers.
Is there scope for more emphasis on supply chain vulnerability?
 - ▶ Can reporting standards extend to non-listed (smaller) firms?

Final Point on Prices

There are well-known biases in materials and import price indexes:

- ▶ BLS Import Price Indexes do not capture gains from cost-saving substitution across countries.
- ▶ Standard deflators for materials do not capture cost-saving substitutions between domestic and foreign suppliers.
- ▶ Plus higher order concerns: variety growth & quality adjustment.

All together, we're understating cost-saving due to imports, understating real materials use, and thus overestimating value-added and productivity growth. [See Susan's work!]

What to do?

- ▶ Address the “sourcing substitution biases” we know about.
- ▶ Explore using customs data with unit values & variety.
- ▶ Consider economic approaches to impute variety & quality-adjusted price changes (e.g., sufficient statistics).

Christmas is NOT cancelled!

But don't let the crisis go to waste.