

Hidden Exposure: Measuring US Supply Chain Reliance
by Richard Baldwin, Rebecca Freeman, and Angelos Theodorakopoulos

Discussion by
Pinelopi K Goldberg
Yale University

Brookings Papers on Economic Activity Conference
September 28, 2023

How do we increase resilience?

From Goldberg and Reed (BPEA, March 2023):

1. Need to define resilience
 - Bend but Not Break (Reed vs. Oak)
2. Need to operationalize it and benchmark it
 - What is the desired level of resilience?
Involves value judgements by a society
3. Need to measure it

On Measurement...

BUT:

We can only make progress on 3. if we have resolved 1. and 2.

→ Need to know what to measure

Here, following conceptual point is important:

Resilience can only be evaluated with reference to specific shocks

Relevant considerations

- **Nature and Magnitude of Shock**
 - i. Supply, Demand, or Both
 - ii. Sector- , Country-specific, or Both
 - iii. Idiosyncratic or Systemic

- **Time Horizon (short-, medium- or long-run)**
 - i. Dependent on sector (food, medicines: time is of the essence)
 - ii. Dependent on (possibly non-homothetic) preferences (consumers in rich countries without well-developed public transportation may consider a car a necessity)

- **Level of Aggregation**
 - i. Economy-Level
 - ii. Industry-Level
 - iii. Firm-Level
 - iv. Household-Level

Contribution of Current Paper

- Contribution is on 3.
 - Measurement of GVC exposure to individual exporters
- Valuable measurement exercise
- My comments: Implications of results of this measurement
 - For Trade Policy
 - For Resilience

The Measurement Exercise

- Measure: What share of a country's (manufacturing) intermediate input imports are sourced from each importing country?
- Important distinction between “face-value” measure (based on direct bilateral imports) and “look-through” measure (that takes into account all input-output linkages)
- For the latter need ICIO tables.
- Main drawback of ICIO tables: Available only at a very aggregate level: 17 manufacturing sectors (will come back to this)
- Takeaway: Beware of China! The look-through measure suggests that US dependence on China is five times as large as one would have inferred based on face-value bilateral imports.

The Measurement Exercise (contd.)

Question: Why do we need another GVC-related measure?

Answer: Existing measures (e.g., backward or forward integration) developed for different reasons.

Agree:

- Trade is measured in gross value terms. There is a rich literature trying to measure it in net terms.
- Initial motivation for this literature: Show that China was not as important in international trade as gross trade statistics suggested
- Ironically, now we have the opposite objective: Showing that China is omnipresent.
- But focus has been on TRADE, not on how the domestic economy is affected

Implications for Policy and Resilience

Value of Results:

1. We can debate what they mean for “resilience.” But they imply that complete “De-Chinafication” of the US economy may be very costly, if not impossible.
2. Valuable application: Understand (often surprising) effects of trade policies as global trade flows get reallocated
3. Example: US-China Trade War

Implications for Trade Policy

The US-China Trade War

- US imposes tariffs on China to reduce Chinese exports to the US
 - Fajgelbaum et al (2010): Direct Exports from China to the US decline
 - Alfaro and Chor (Jackson Hole, 2023): US Reallocation away from China towards Vietnam, Mexico, etc.

- BUT: Authors' results suggest that this may not reduce dependence on China as much as anticipated
 - ❑ Why? Let's say US consumers substitute away from Chinese imports toward imports from other countries, e.g., Vietnam.
 - ❑ As Vietnam's exports to the US increase, Chinese exports of intermediates to Vietnam (in order to produce Vietnamese products that will be exported to the US) increase too. So INDIRECT Chinese exports to the US increase too.
 - ❑ Fajgelbaum et al (2023): Indeed US-China trade war had unanticipated effects that are hard to understand without understanding the full production network and IO structure of global trade flows.

Implications for Trade Policy (contd).

The US-China Trade War

- Authors make important progress in that direction.
 - Use more recent data when available to document more recent effects
- Caveat: Sectoral data may be too coarse to accurately measure the effects
 - ❑ See de Gortari (2022) on Mexico: US value-added in Mexican exports to the US is 16% ON AVERAGE. But US value-added in Mexican autos exported to the US is 74%. US value-added in Mexican autos exported to Germany is only 18%.

Implications for Resilience

(the main motivation of the paper)

Some Issues:

- **Figure 2.3:** Look-through share of China in US manufacturing inputs is 3.5% on average, and as high as 6.3% in textiles. Is this high? What is the benchmark?
- **Import shares are not a sufficient statistic for dependency/resilience**
 - But they can serve as a red flag
 - Analogous to the use of shares/HHI in antitrust
 - Need substitution elasticities on the demand side and supply elasticities. But these depend on the aggregation level.
 - At a granular level, technologies are often Leontief. But more substitutability at a higher level.
 - Question: What is the relevant level of aggregation for resilience? → CONCEPTUAL ISSUE (see earlier discussion)

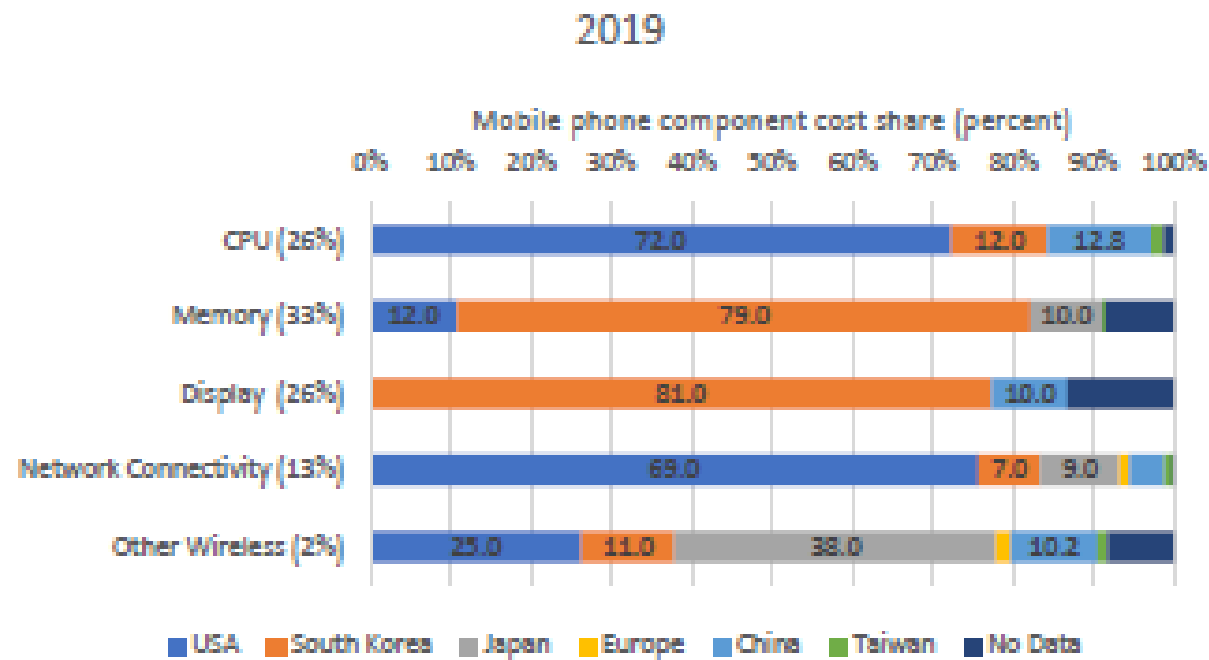
Implications for Resilience – Issues (contd.)

- **Level of aggregation: Policy issues related to resilience often play out at a much granular level. Some examples:**
 - Commercial Aerospace: Rolls Royce’s Trent 900 Engine for Airbus A380 (Elliott, Golub and Leduc, 2022)
 - Semiconductors: Why is Taiwan important?

92% of advanced logic capacity <10nm is in Taiwan (and the other 8% in Korea). Hence, concern about implications of a Chinese invasion of Taiwan...

 - not reflected in sectoral data.
 - Smartphones: Concept of “massive modularity” (Thun, Taglioni, Sturgeon and Dallas, 2022).
 - Extremely complex modular ecosystems
 - High degree of international specialization at the component level
 - High concentration of individual components/functions
- Decoupling from specific countries would be extremely costly!**

From Thun, Taglioni, Sturgeon and Dallas, 2022:



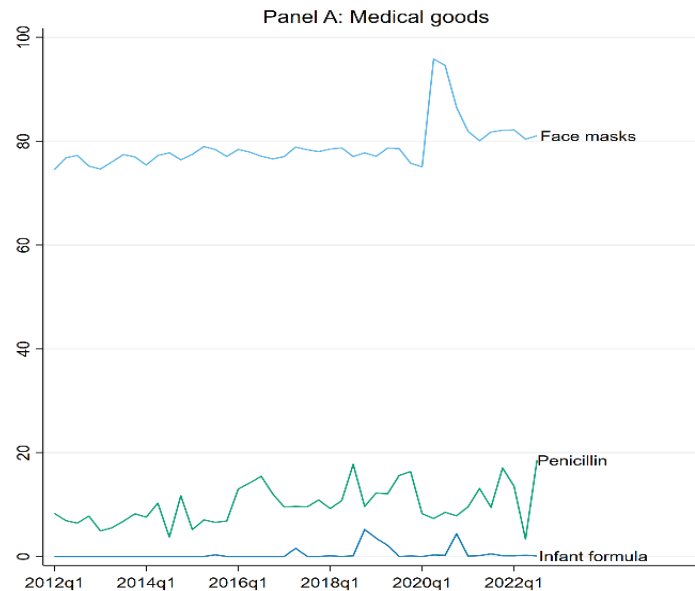
Implications for Resilience – Issues (contd.)

- **Resilience cannot be evaluated without reference to a specific shock**
 - Let's take the claim that the US is highly dependent on China at face value. What does this imply for resilience?
 - Authors argue that systemic shocks will become more important. Perhaps. But even so...
 - If a country-specific shock hit China, the US (and the whole world) would be vulnerable.
 - However, there are two types of shocks: Natural/exogenous to policy (at least in short-term horizons)
 - Man (i.e., policy)-made
 - Natural disaster hitting the whole of China unlikely. But policy-induced shocks, e.g., geopolitical tensions with individual countries, very likely.
 - In this case, international interdependence implies, once again, that complete decoupling from China may be impossible. If such decoupling is pursued, it will require cooperation from all other countries (→ weaponization of international interdependence, see recent export restrictions in semiconductors). But then the pain will be self-inflicted.

Implications for Resilience – Issues (contd.)

- **Even when there is high dependency (in terms of shares or availability of alternative supply sources), implications for “resilience” unclear.**
 - Example: Direct “face-value” import dependency from China small in most product categories (Evenett 2020, Goldberg and Reed 2023).
 - One exception: Face masks. Ca. 80% of US imports of face masks come from China
 - And these imports contributed to resilience during COVID-19

Percent of US Imports from “Non-Friendly” Countries



To Conclude

- Valuable measurement exercise
- Will have important applications, especially in assessing the effects of trade policies
 - The GVC literature tends to emphasize the “magnification” effect of tariffs, but here we may get a “mitigation” effect on the exports of the targeted country
- But skeptical that these measures can guide resilience discussion
- Need to be complemented by case studies of individual sectors/products that will employ micro data
- But they show that a complete De-Chinafication of the US economy would be very costly
- High degree of international interdependence suggests need to cooperate

THANK YOU!