

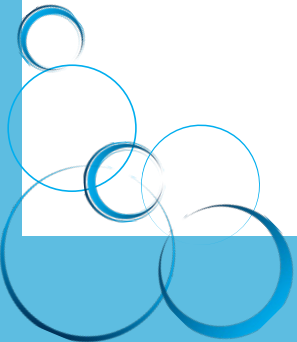
Evolution of Knowledge on Benefits and Risks of Global Value Chains



Yasuyuki Todo

Waseda University

yastodo@waseda.jp



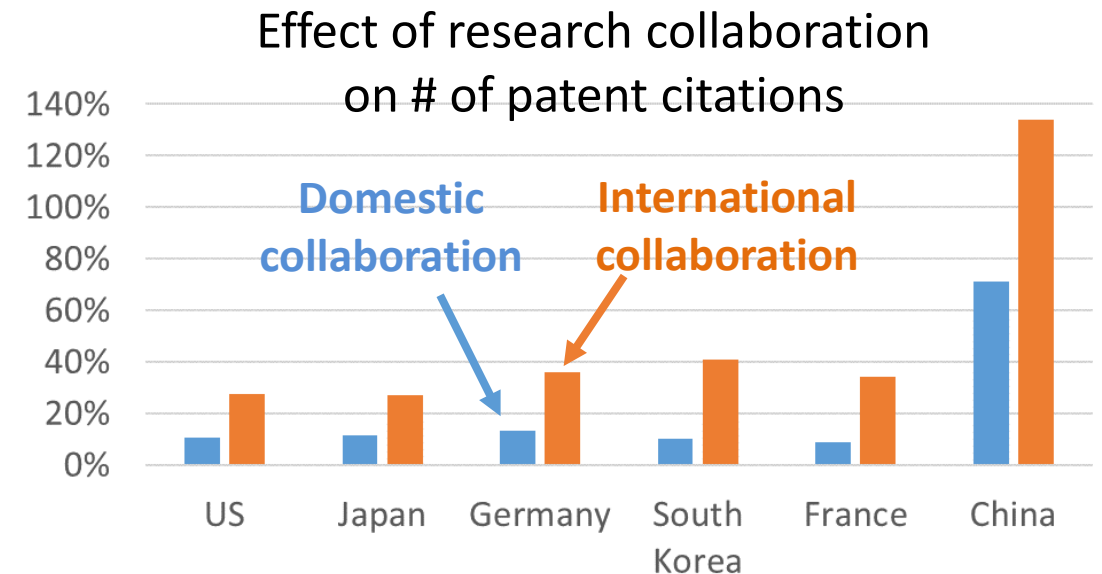
Benefits of GVC participation: Productivity growth

Evidence

- Learning by exporting Blalock et al. (2004, JDE); Van Bieasebroek (2005, JIE); Atkin et al. (2017, QJE); Barcia-Martin et al. (2019, JPE); Benkovskis et al. (2020, RWE).
- Learning through supplier-customer relationships with FDI firms Javorcik (2004, AER); Lu et al. (2017, JIE); Abegaz et al. (2021, JID); Alfaro-Urena et al. (2022, QJE)

Remaining policy question

- How can policies upgrade supply chains to knowledge networks?
 - *Keiretsu* relationships between Japanese suppliers and customers are often associated with technical assistance and research collaboration. Branstetter (2000, JJIE); Suzuki (1993, IJIO)
 - International research collaboration promotes innovation (Iino et al. 2021), but is insufficient in emerging and developing countries.



Iino, Inoue, Saito, Todo (2021, JER)

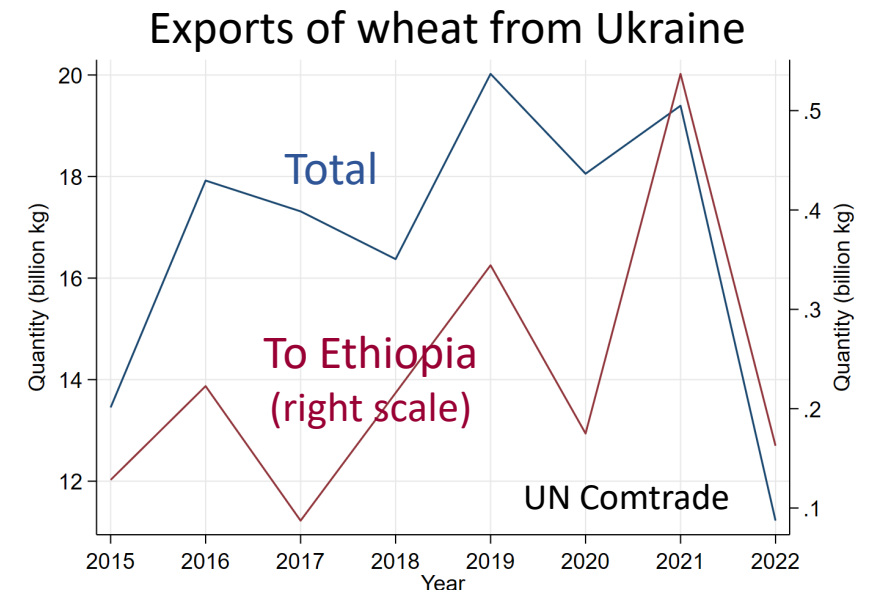
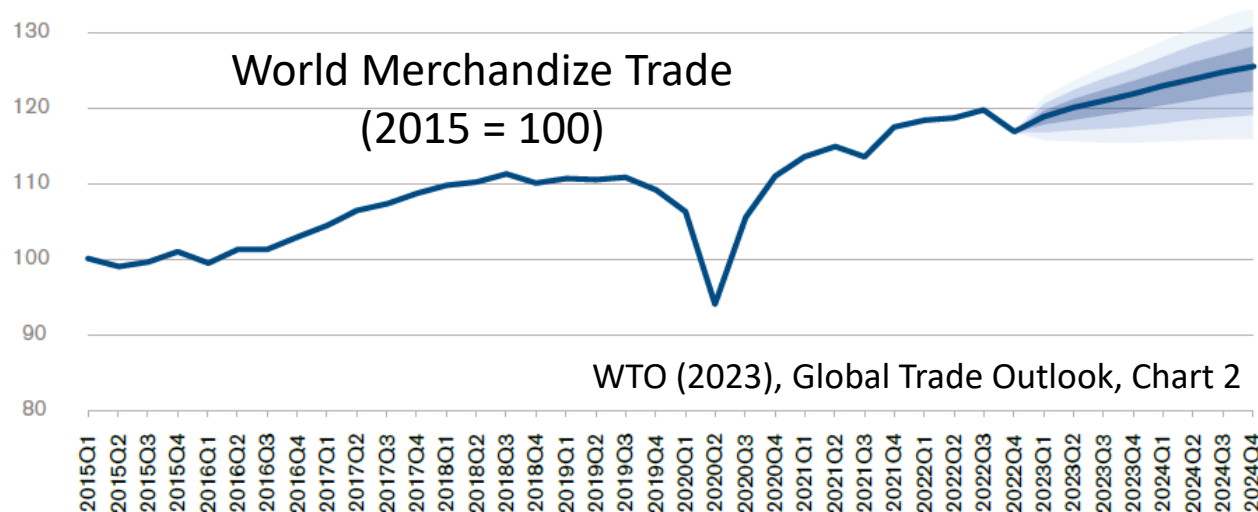
But, GVC participation incurs risks.

Recently, GVCs have often been disrupted by

- Natural disasters (e.g., the Great East Japan earthquake, the 2011 Thailand floods)
- Pandemics (e.g., COVID-19)
- Military conflicts (e.g., the Russo-Ukraine War)

➔ Negative impacts on production and welfare in developing countries

➔ Need to minimize risks



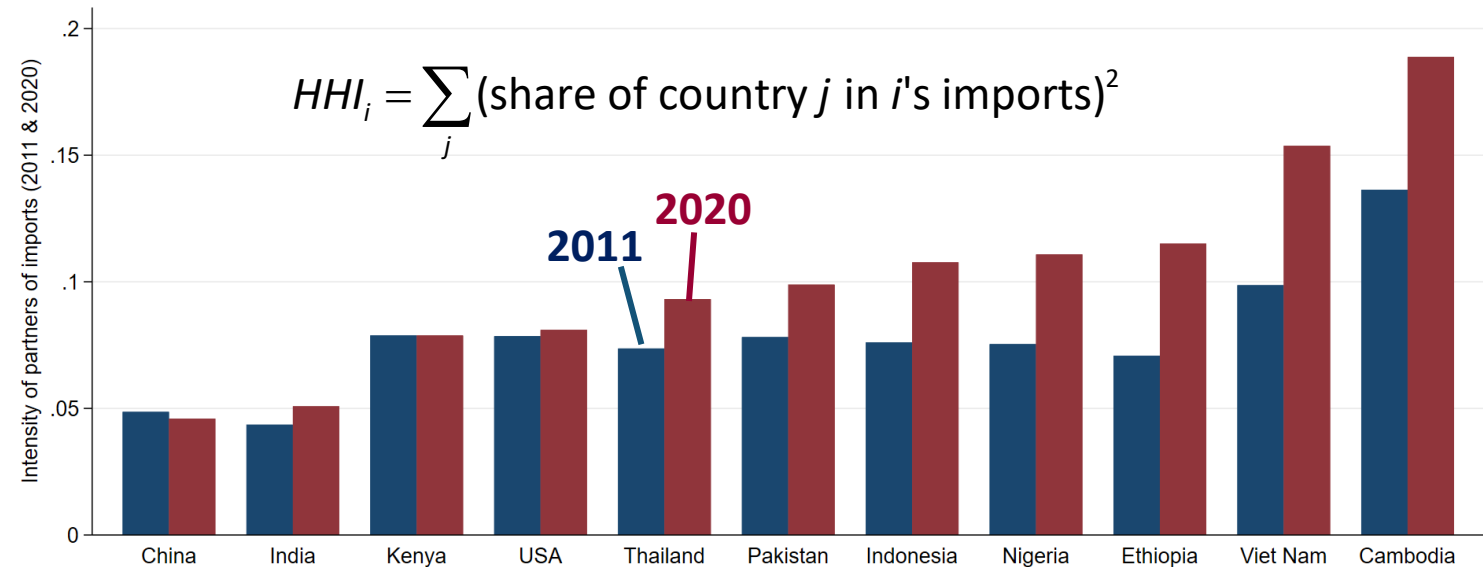
Risks are becoming larger.

Source countries of imports are more and more **concentrated** for many developing countries



Risk of large economic loss when international trade is disrupted

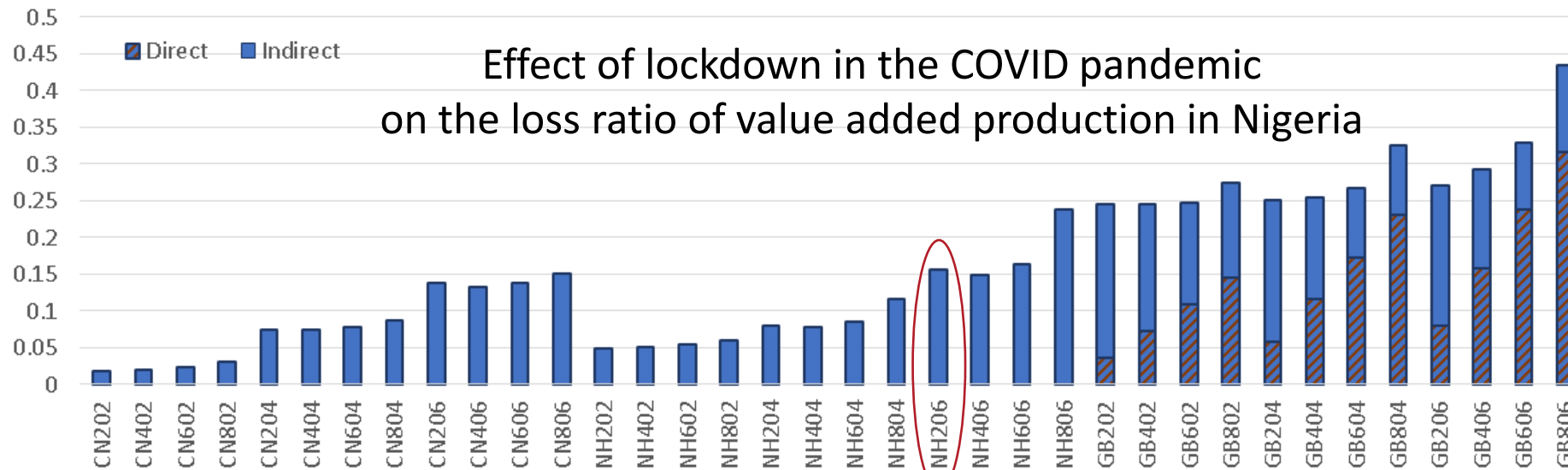
Index of intensity (Herfindahl and Hirschman Index) of source countries of imports in 2011 & 2020



Source: UN Comtrade.

Economic shocks propagate through supply chains

- **Econometric analysis** confirms propagation through firm-level supply chains.
Barrot & Saubagnat (2016, QJE), Boehm et al. (2019, REStat), Carvalho et al. (2021, QJE), Kashiwagi and Todo (2021, RIE)
- **Simulation analysis** quantifies economic loss due to the COVID-19 pandemic using country-industry input-output tables.
→ large indirect effect on developing countries
Guan et al. (2020, Nature Human Behaviour), McKibbin and Fernando (2021, Asian Econ Papers)



CN202: Lockdown in China with strictness of 20% for 2 months. NH: China, Europe, and the US, GB: all countries.

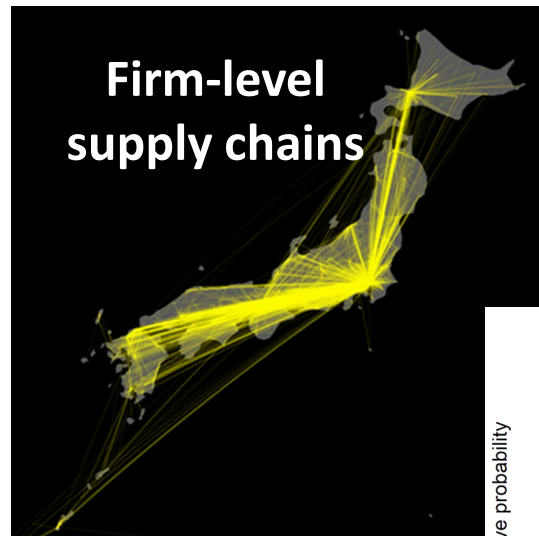
Guan et al. (2020), SI.

Economic shocks propagate through supply chains

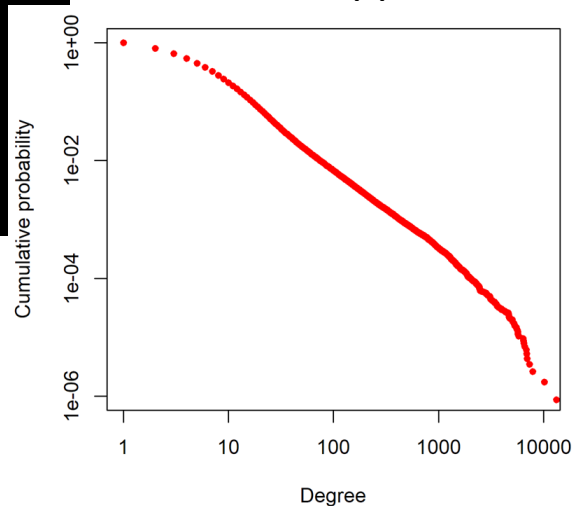
- **Firm-level simulation** to incorporate complexity of supply chains

Inoue and Todo (2019, Nature Sustainability); Inoue and Todo (2022, RIETI DP)

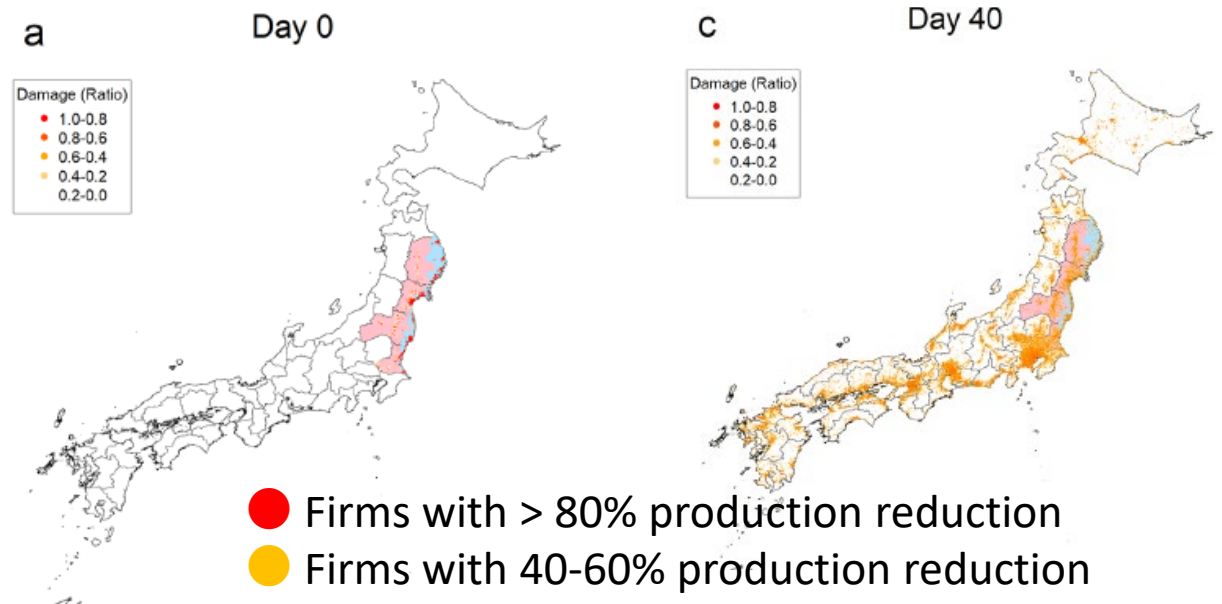
➔ **Firm-level network structure** matters to the propagation effect.



Power-law distribution of # of suppliers

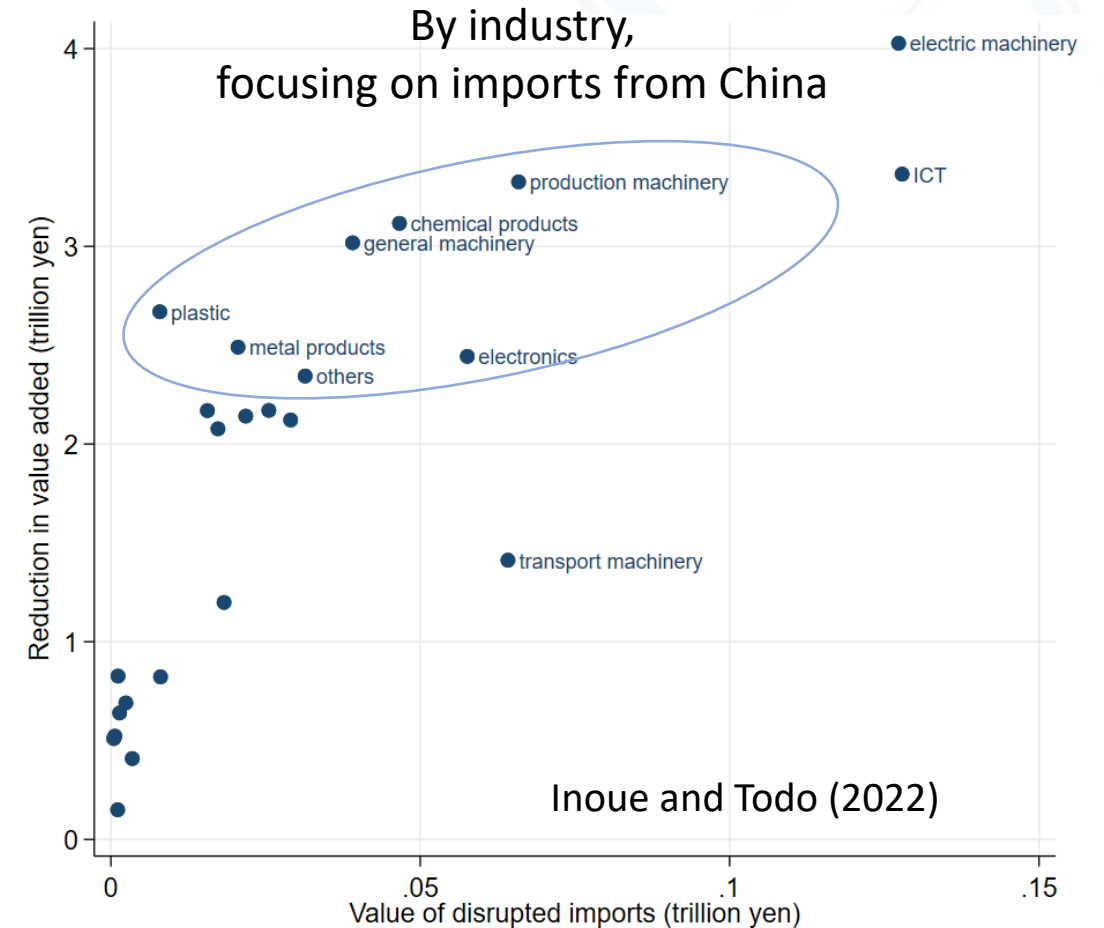
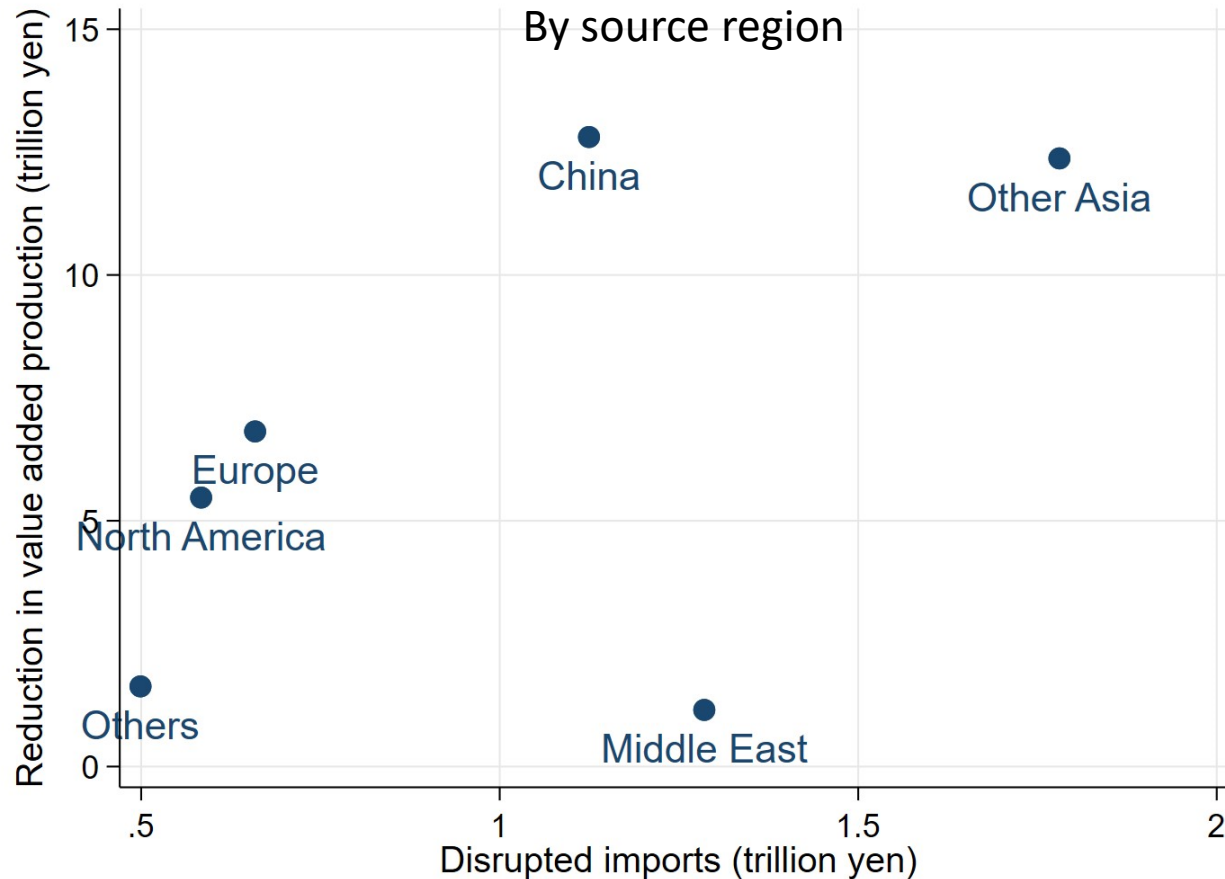


Propagation of economic shocks by the Great East Japan earthquake to regions not directly affected



Large effect of disruption of imports of upstream products

Effect of disruption of imports by 80% for 2 months on Japanese production



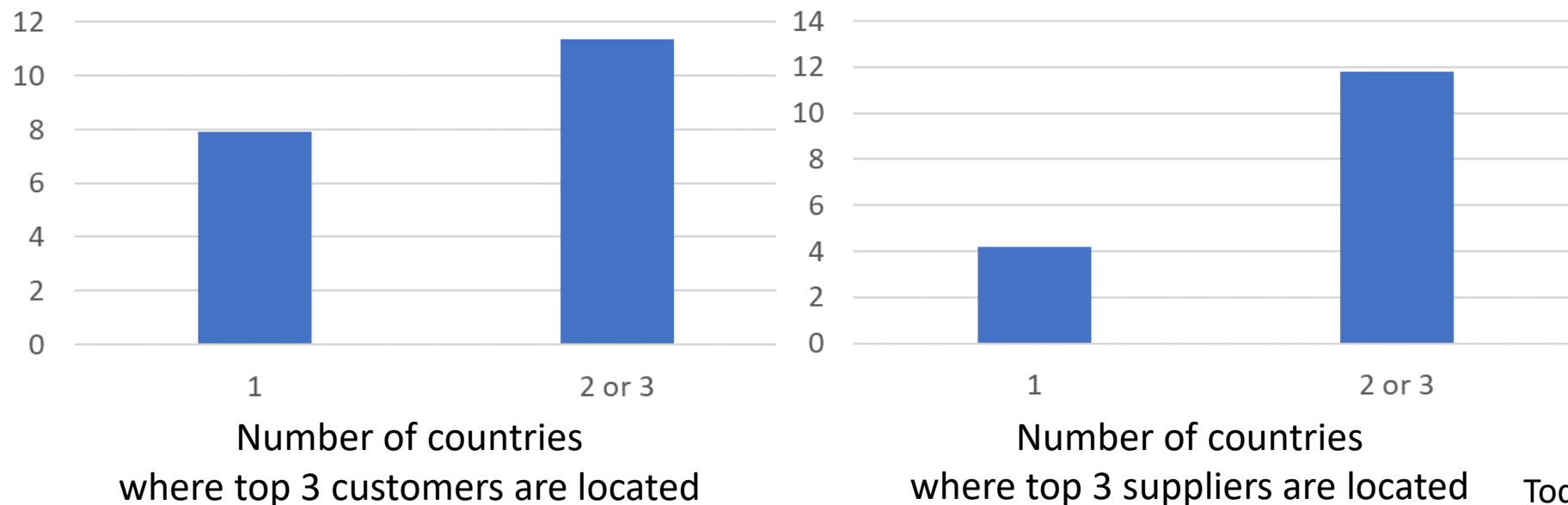
Inoue and Todo (2022)

Substitutability of inputs by diversifying partners mitigates propagation.

- **Input specificity** aggravate propagation through supply chains (Barrot et al. 2016)
- **Regional diversity** of trade partners promotes resilience
Todo et al. (2023, World Economy); Ando and Hayakawa (2021, JITED), Kashiwagi and Todo (2021, RIE)

Share of resilient firms in ASEAN and India in the COVID-19 pandemic (%)

Resilient firms: shrink transaction with 1 customer/supplier because of pandemic but increase transaction with another

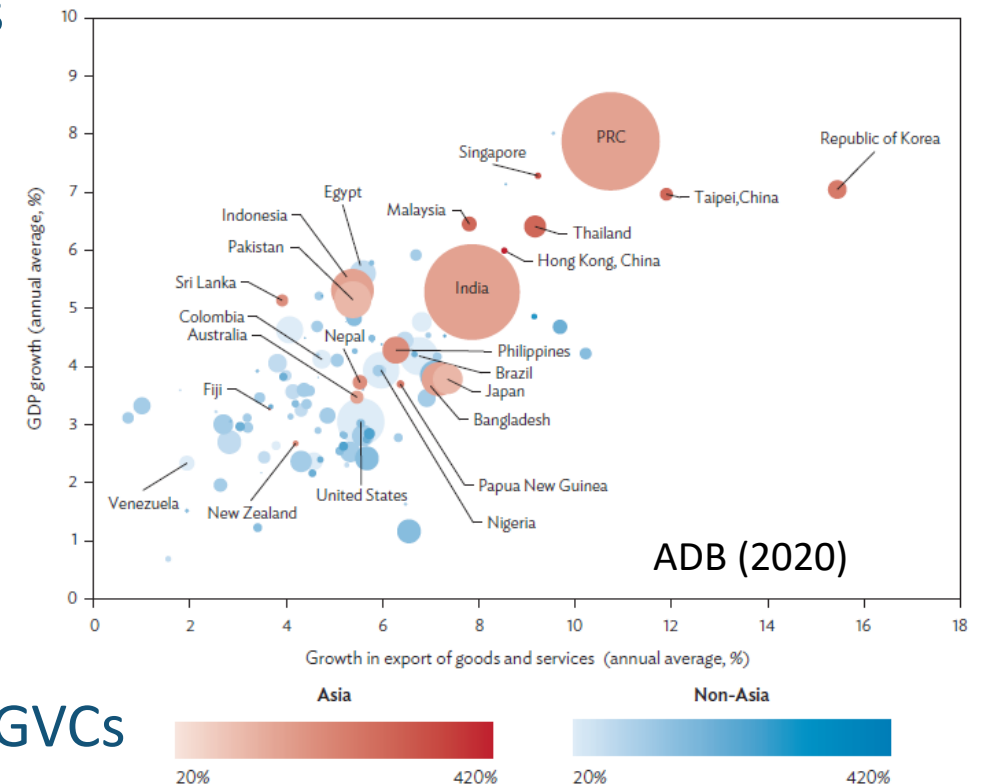


Todo et al. (2023)

Supply chain diversification or protectionism to mitigate risks of GVCs?

- Developed countries are implementing **industrial policies** to onshore production of critical products and to deal with national security concerns.
 - Protectionist policies targeting specific industries may not succeed.
 - In China, industrial policies were successful only when associated with competition within the industry. Aghion et al. (2015, AEJ Macro)
 - East Asia's high growth is attributable to export-oriented policies, rather than protectionism.
- Asian Development Bank (2020), Asia's Journey to Prosperity.

Figure 9.4: Export Growth and Economic Growth, 1960–2017



➔ Need to balance between benefits and risks of GVCs

Remaining policy questions

- What is the **optimum level of diversification** of trade partners to balance efficiency and resilience for developing countries?
 - Costs of diversification
 - Security of essential products
- What are **effective policies** for diversification of trade partners?
 - Export and FDI promotion (Makioka, 2021; Martincus and Molinari, 2007; Van Biesebroeck, et al., 2016)
 - Role of multilateral DTAs?
- What are the relationships between **trade and national security**?
 - Positive role of economic integration in conflict prevention (Bussmann 2010; Hegre et al. 2010; Kinne 2012)
 - But diversity of trade partners is not incorporated.
 - Can **international trade rules** separate national security from trade? How can they be set up?