Exposure to shocks

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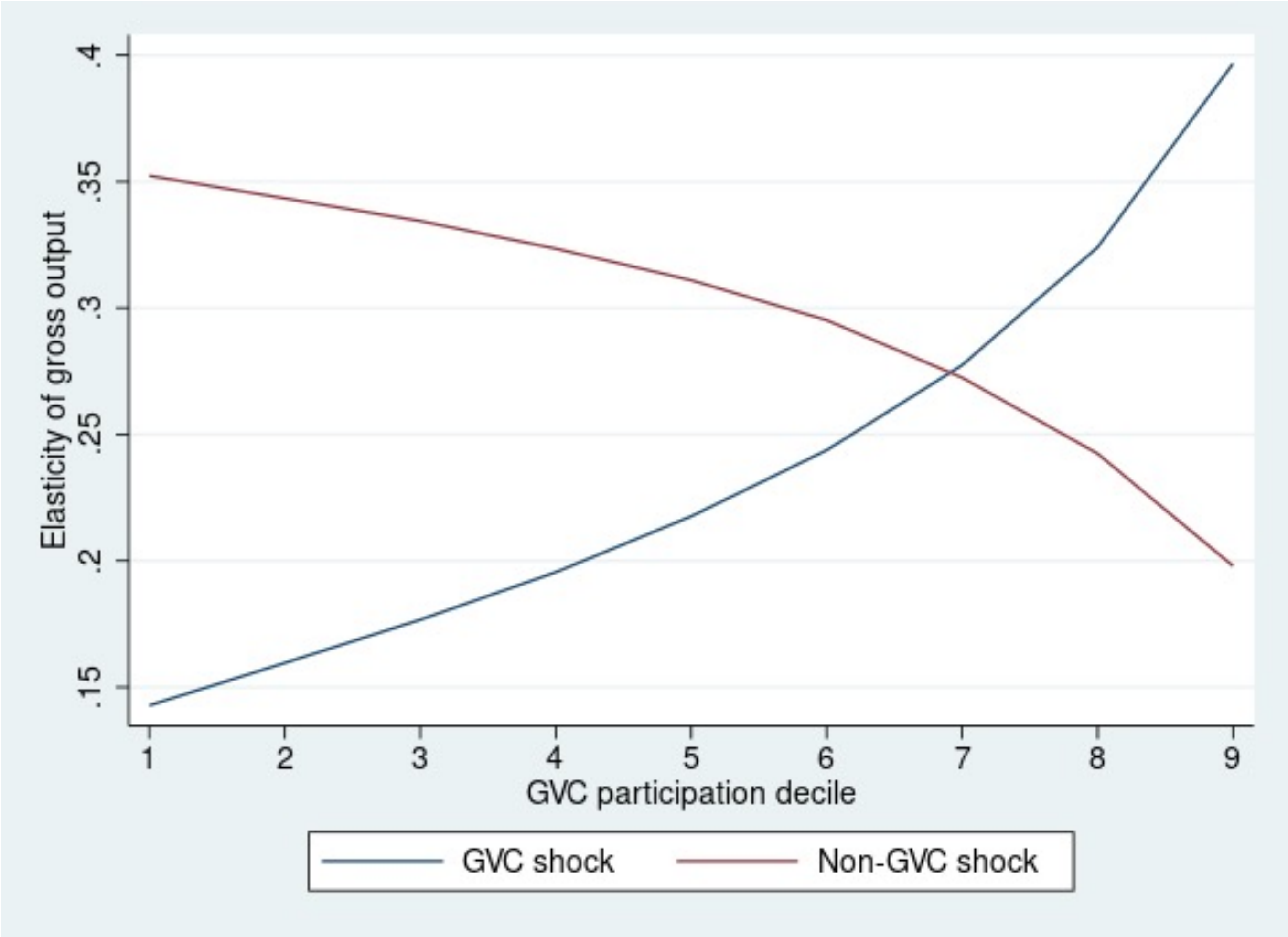
Quantifying Exposure

- Measuring exposure requires assessing GVC participation.
- Ideally, one should use a firm-level approach to GVC participation, however this is severely constrained by data availability (Bems and Kikkawa, 2021).
- Despite limitations, macro-approach to GVC participation can be used to assess countries and sectors participation and exposure (Antras, 2021).
  - Standard measures overestimate backward linkages and underestimate some sectors and countries participation.
  - Two fixes:
    - **Operate a decomposition of GVC linkages in three types of engagement**: pure backward, pure forward, and two-sided (i.e. simultaneous backward and forward).
    - Backward participation substantially lower than in standard approaches, since for almost 70 percent of country-sector pairs worldwide, “two-sided” exposure is the prevalent mode of participation.
    - **Use measures based on output**: Looking only at GVC trade understates the actual extent of GVCs by half, as GVC trade amounts to about US$10 trillion, while GVC output to about US$20 trillion .

GVC participation dampens the transmission of direct shocks, and it increases the exposure to global shocks.

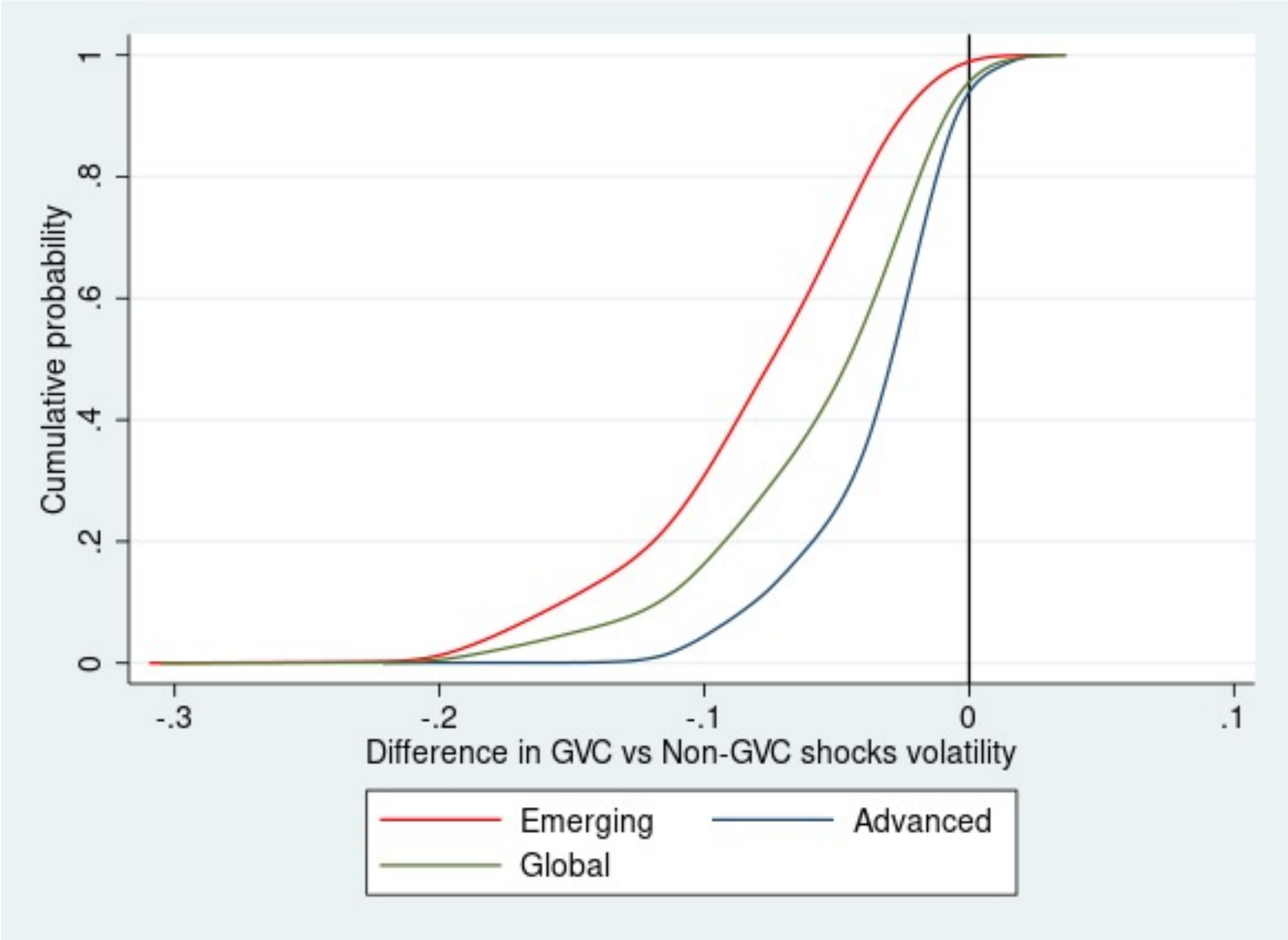
Output elasticity to GVC and non-GVC demand shocks



Source: Borin, Mancini, Taglioni (World Bank 2021 and VOXEU 2022)

The volatility of GVC-related demand shocks is lower than the volatility of direct demand shocks, for more than 90% of country-sector pairs worldwide.

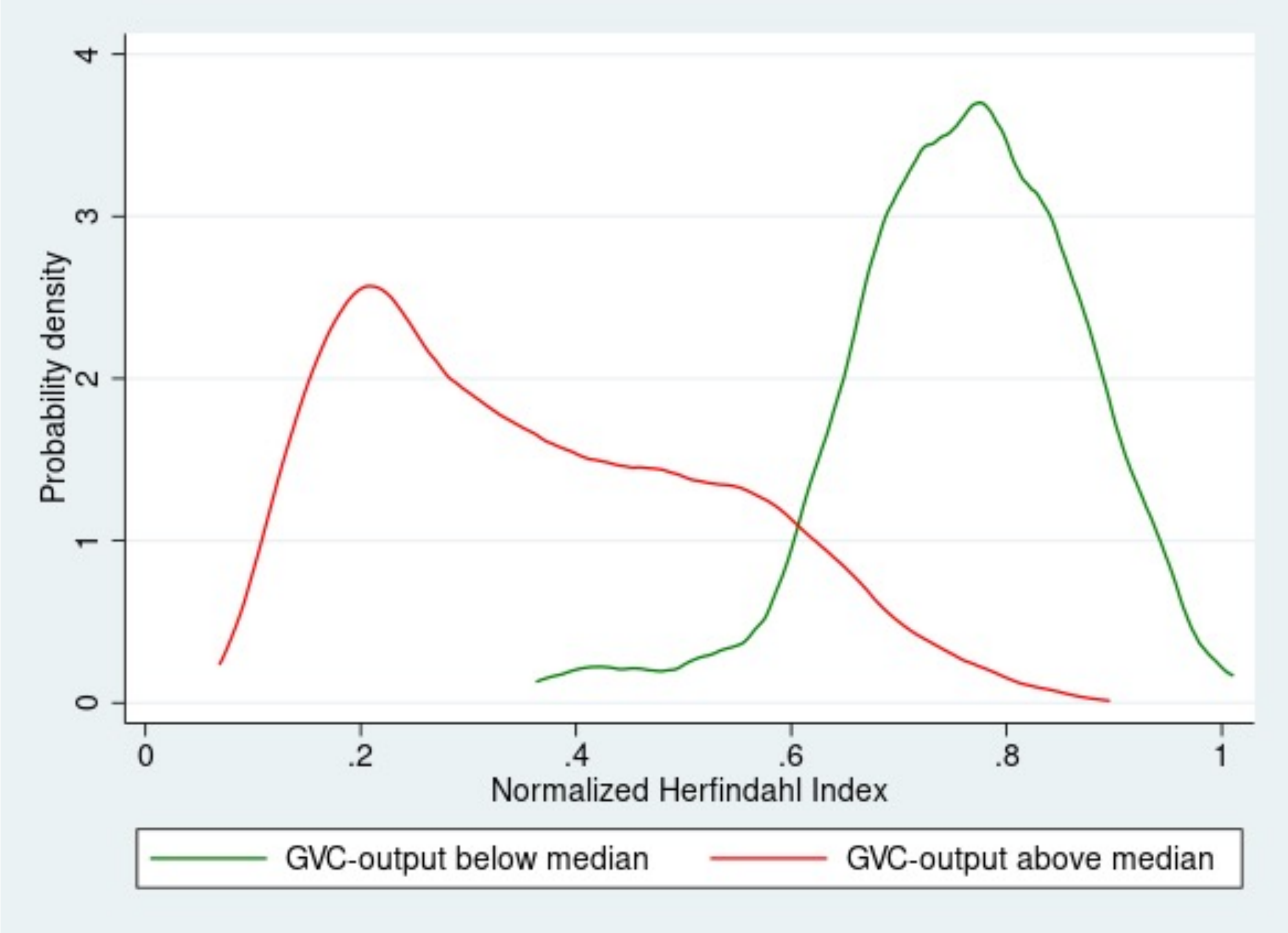
Cumulative probability of the difference between GVC- and non-GVC-related shock volatility (country-sectors pairs)



Source: Borin, Mancini, Taglioni ([World Bank 2021](#) and [VOXEU 2022](#))

GVC participation is associated with greater market diversification and resilience.

Normalised Herfindal-Hirschman Index (HHI) of final market concentration, by GVC participation intensity



Source: Borin, Mancini, Taglioni ([World Bank 2021](#) and [VOXEU 2022](#))

In Conclusion

- Negative factors such as strong external dependency in key inputs should be weighed in against beneficial effects of higher market differentiation.
- The importance of two-sided exposure suggest that disruptions may not be easily managed by unilateral policy attempts at forcing a reorganization of buyers-seller relationships.
- Intermediate solutions, such as engagement in “regional” value chains and in traditional trade are not necessarily the correct policy response, since they are likely to present an intermediate profile of exposure to risk.

References

- Borin, A, M Mancini and D Taglioni (2021), "Measuring Exposure to Risk in Global Value Chains", World Bank Policy Research Working Paper; No. 9785.

- Borin, A, M Mancini and D Taglioni (2022), "Integration in global value chains might not increase exposure to risk after all", VOXEU Column.

- Data, data visualizations, and analytical tools:

  - GVC participation measures available on the World Integrated Trade Solutions (WITS) platform: the dataset is available here and the data visualizations here.

  - Belotti, F, A Borin and M Mancini (2021), "icio: Economic Analysis with Inter-Country Input-Output Tables", The Stata Journal 21(3). The Stata Command ICIO is suited to compute indicators of gross and value-added overall (potential) exposure to specific shocks. The command features several pre-loaded IO tables, i.e. WIOD, EORA, OECD TiVA, ADB MRIO (WIOD + other Asian countries, from 2007 to 2019), but it also works on any user-provided IO table.