LUISS

Institute for European Analysis and Policy

Jean Monnet Centre of Excellence on EU Inclusive Open Strategic Autonomy

Trade and GVCs between globalization and fragmentation

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Banca d'Italia

Ph.D Summer School on European Industrial, Innovation and Trade Policy in the Era of Strategic Autonomy, Luiss 5 June 2024

Roadmap

→ Globalization, slowbalization, fragmentation: Where do we stand?

→ Are we already witnessing decoupling or fragmentation?

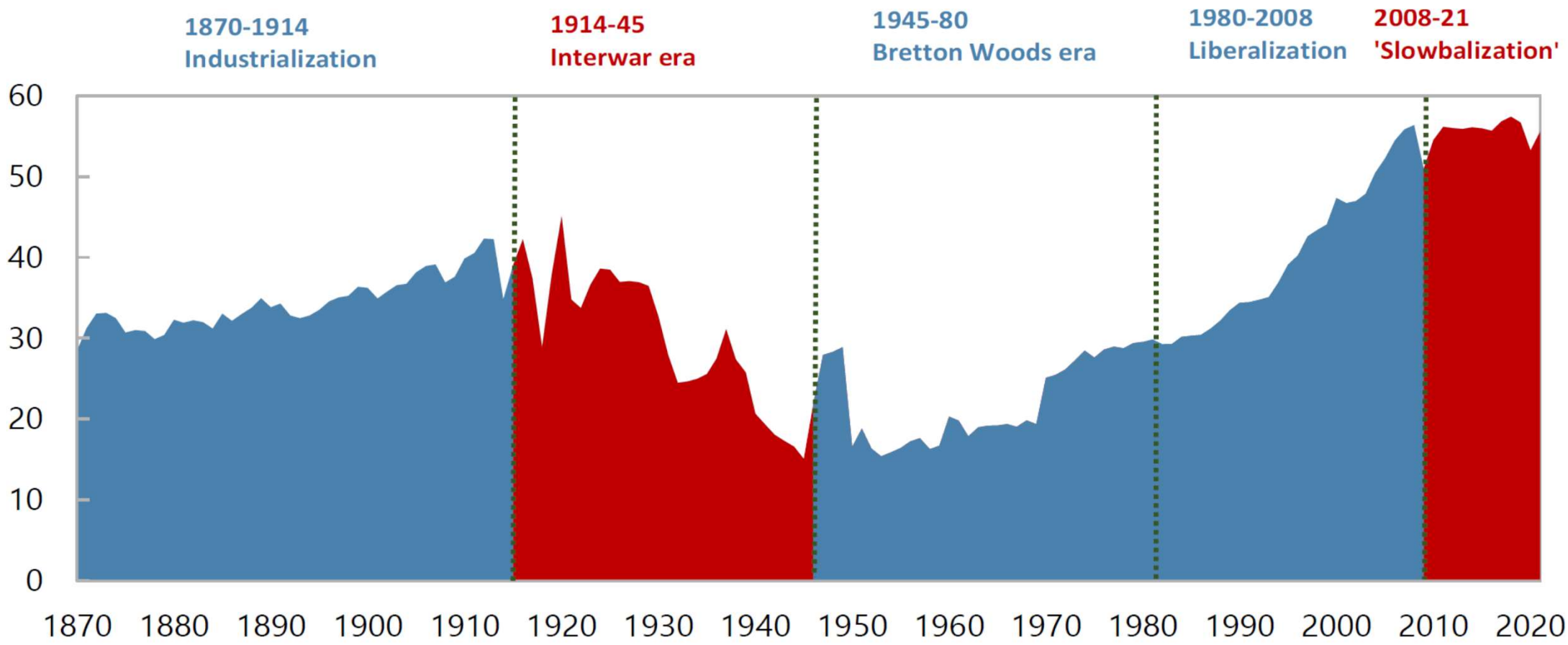
→ What are the potential effects of geoeconomic fragmentation?

→ How can we measure the exposure to supply side disruptions related to foreign dependencies?

From hyperglobalzation to slowbalization

Trade Openness, 1870-2021

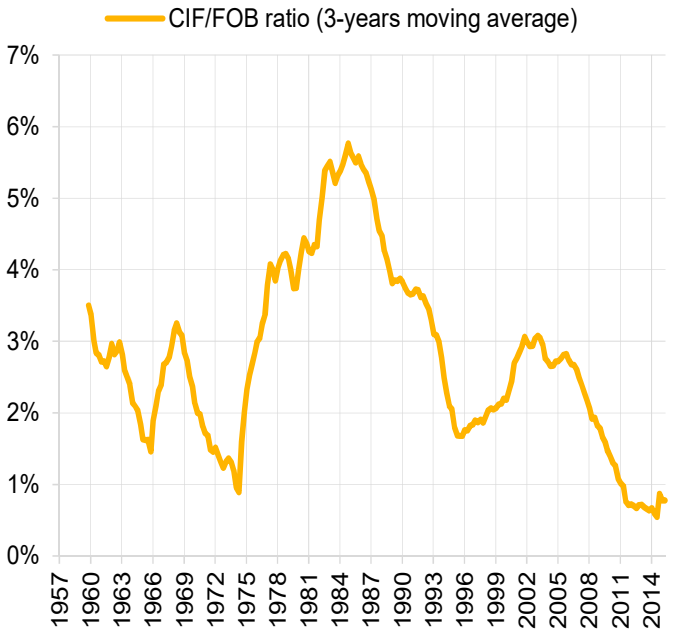
(Sum of exports and imports, percent of GDP)



Source: **IMF, Aiyar et al. 2023, "Geoeconomic Fragmentation and the Future of Multilateralism".**

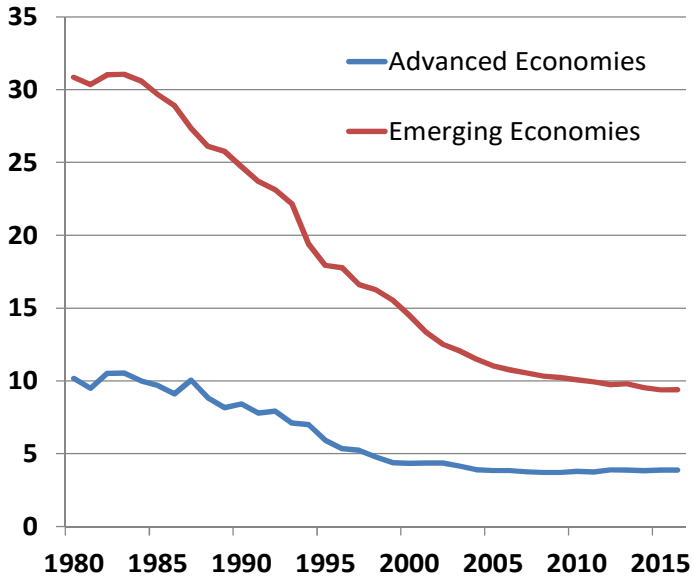
The main drivers of hyperglobalization

World transport costs
(% of imports, based on CIF-FOB ratio)



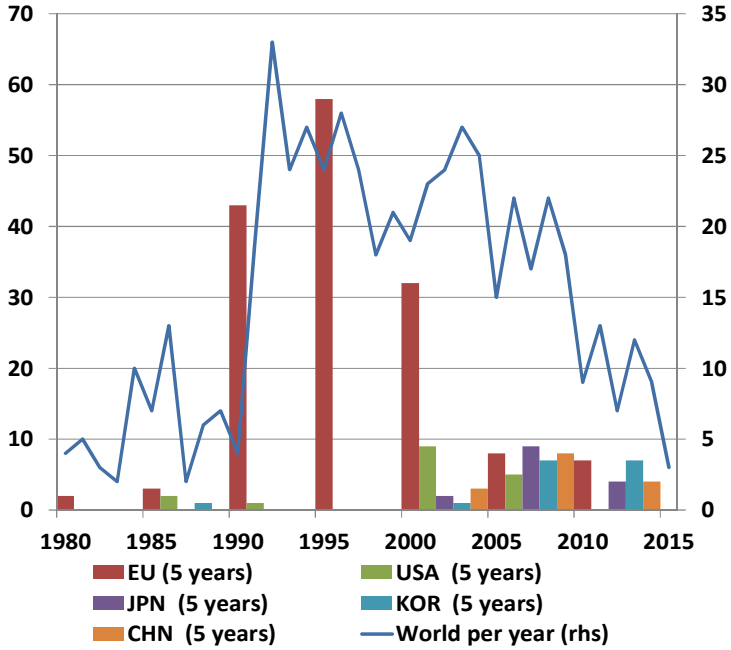
Source: IMF International Financial Statistics database.

Average applied tariffs
(number of new measures)



Source: WTO Tariff Download Facility.

Preferential Trade Agreements
(number by year of signature)



Source: Design of Trade Agreements Database (DESTA) and WTO RTA-IS.

Plus…

→ integration of major emerging economies: China, Eastern Europe, and India

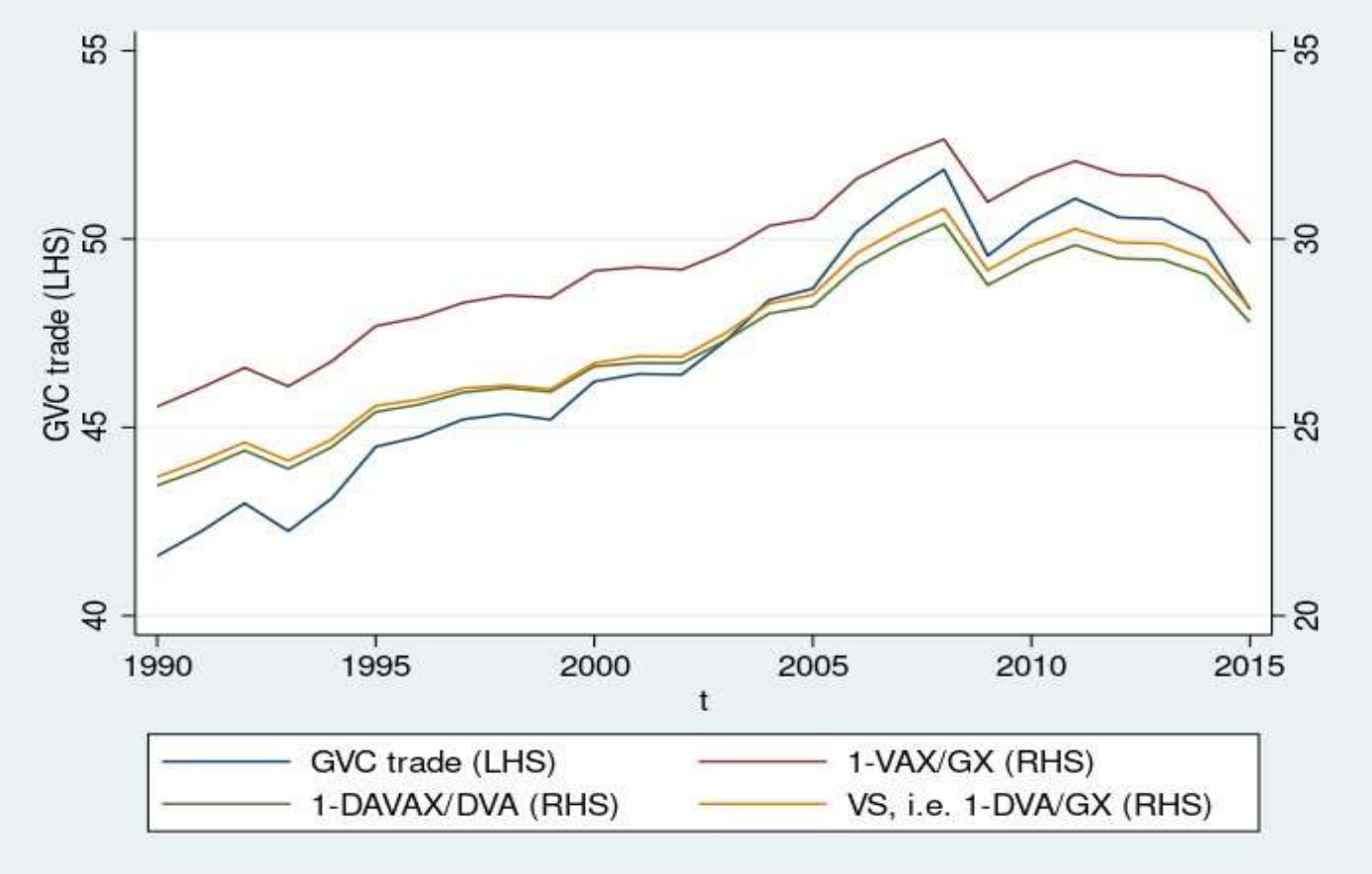
→ ICT revolution that reduced information and coordination costs

→ Reduction of barriers on K-flows → rise of FDIs and MNEs

From hyperglobalization to slowbalization: the role of GVCs

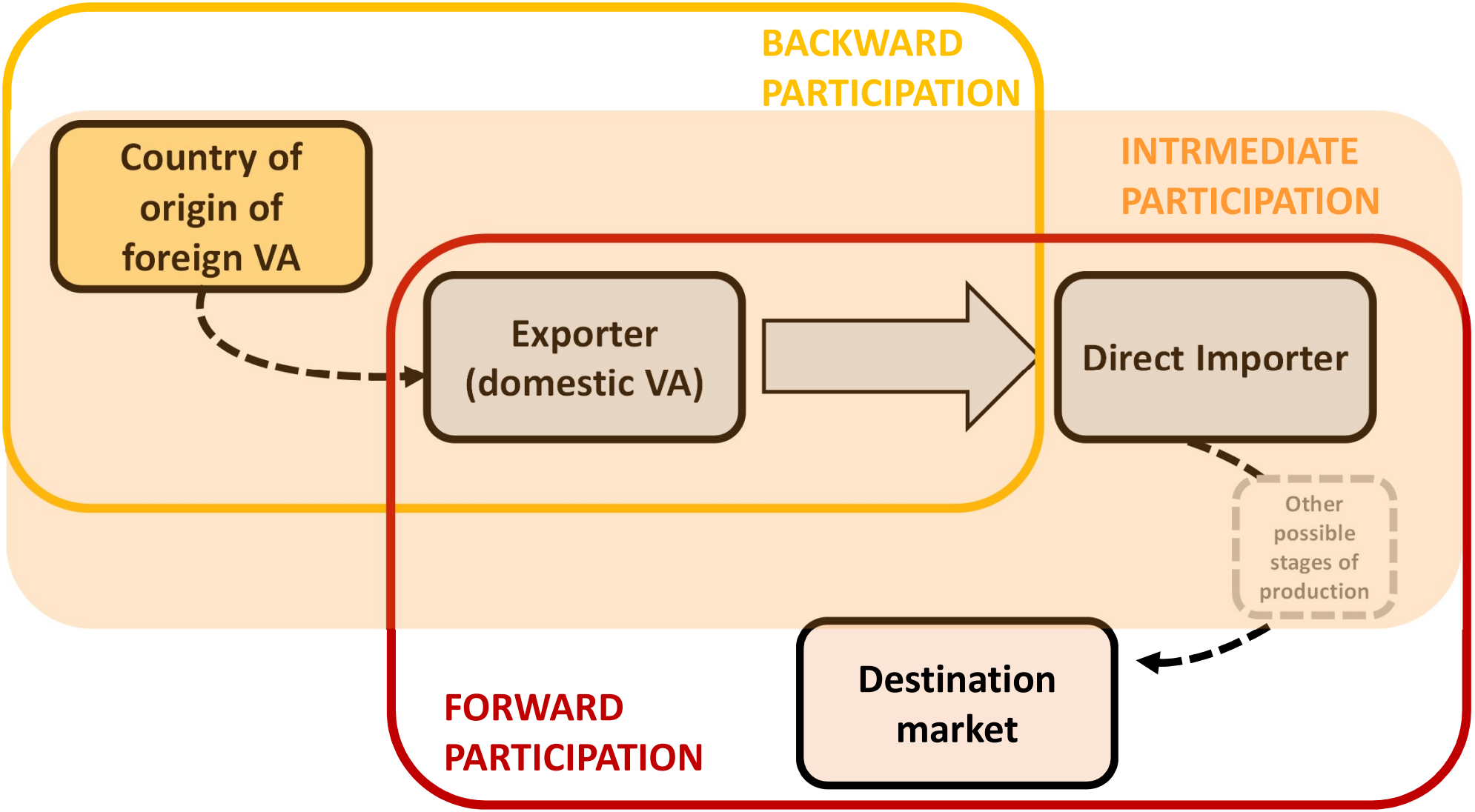
Measure of global GVC integration

(share of global trade)



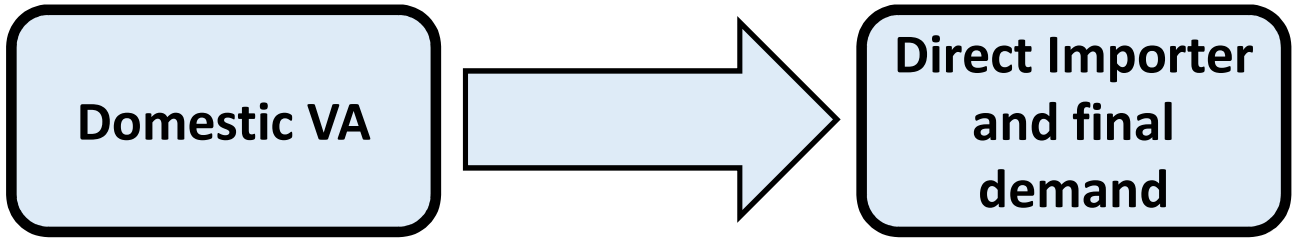
Source: Antràs and Chor, 2021, Borin and Mancini (2019).

How we measure GVC participation?



How we measure GVC participation?

DAVAX: domestic value added directly absorbed by the bilateral importer (Borin and Mancini, 2019)



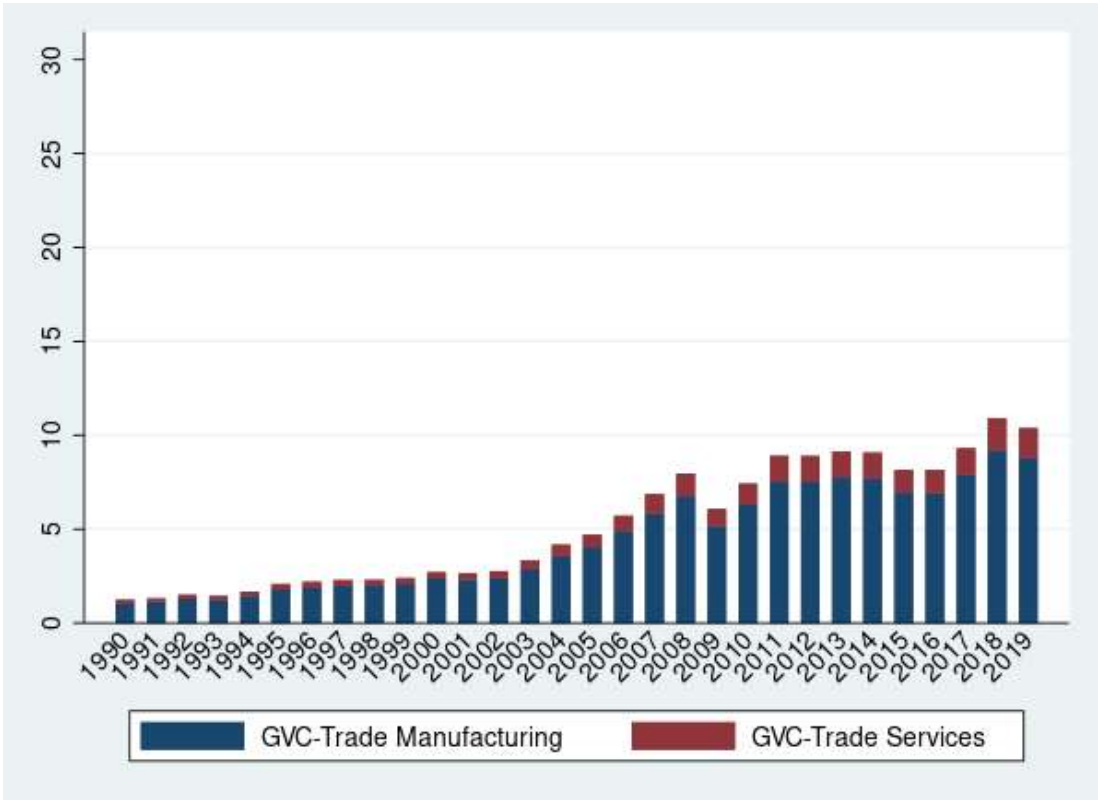
GVC-related trade= (TOTAL EXPORTS-DAVAX).

i.e. the value of trade that crosses at least two borders

$$GVC_{sr} = E_{sr} - DAVAX_{sr} = E_{sr} - \left(\widehat{V_s L_{ss}} Y_{sr} + \widehat{V_s L_{ss}} A_{sr} L_{rr} Y_{rr}\right)$$

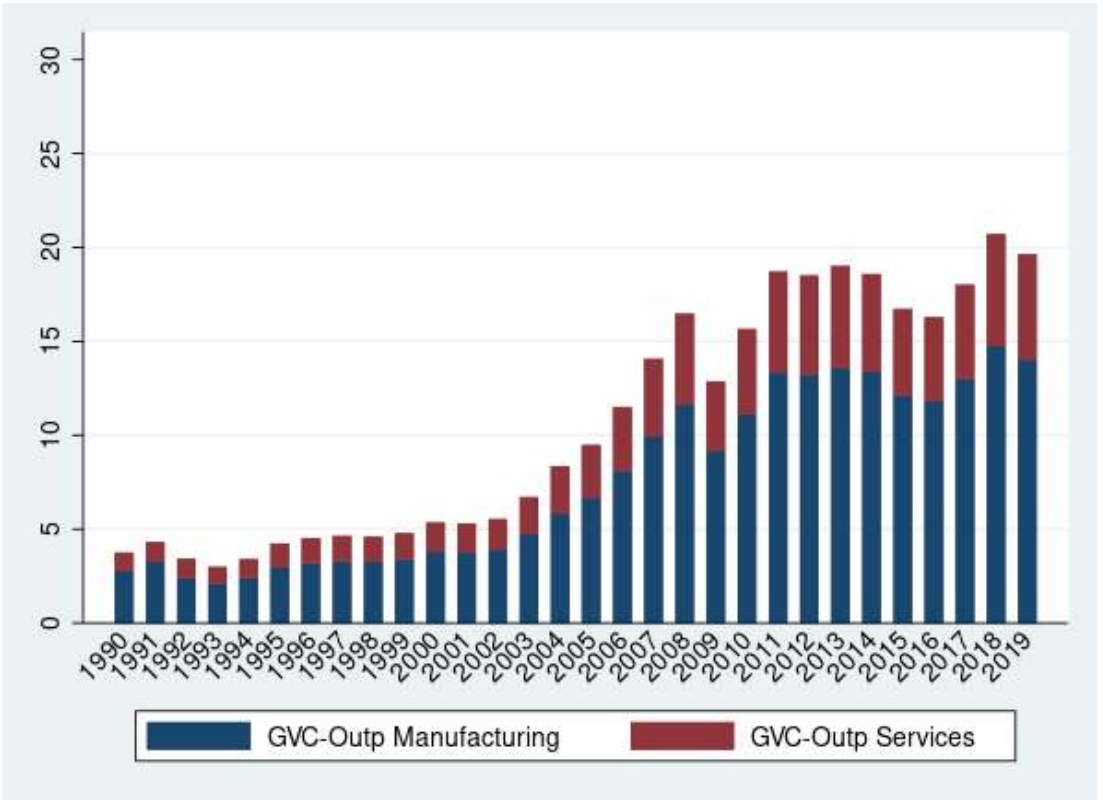
Global production related to GVC goes far beyond trade

GVC-related trade
(trillions of USD)



Source: Borin, Mancini, Taglioni (2023)

GVC-related gross output
(trillions of USD)

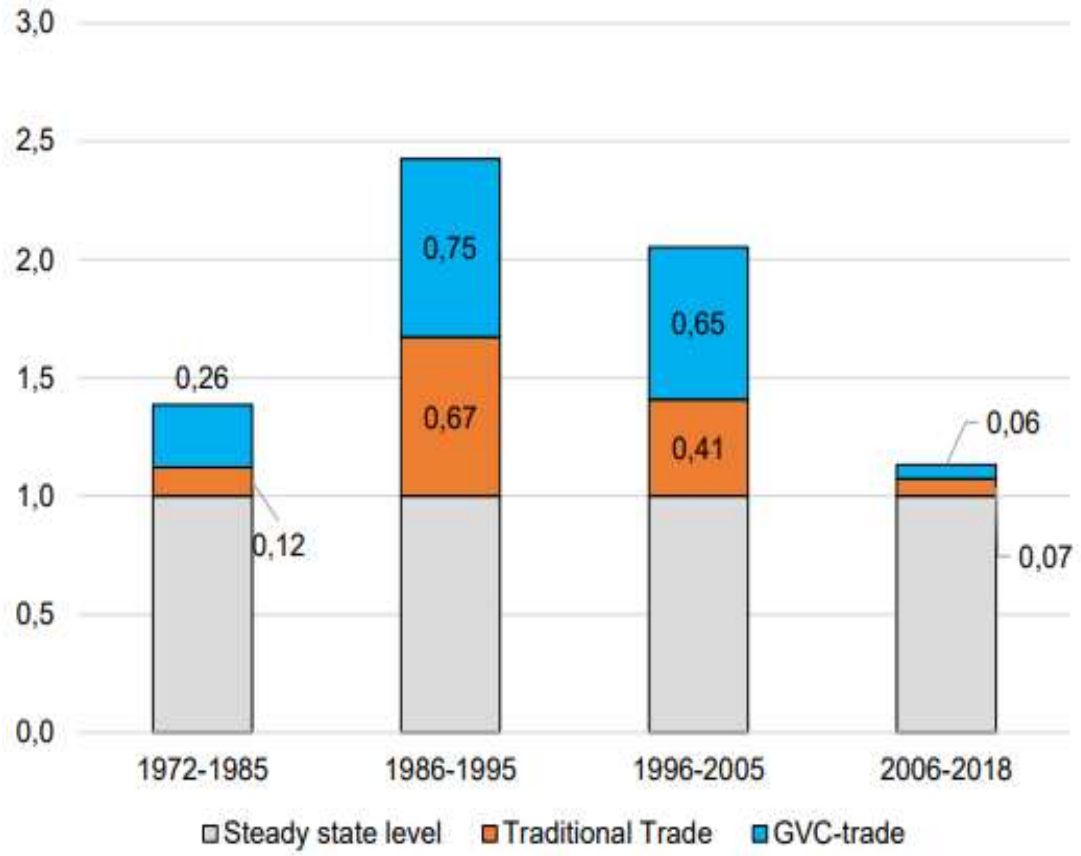


Source: Borin, Mancini, Taglioni (2023)

From hyperglobalization to slowbalization: the role of GVCs

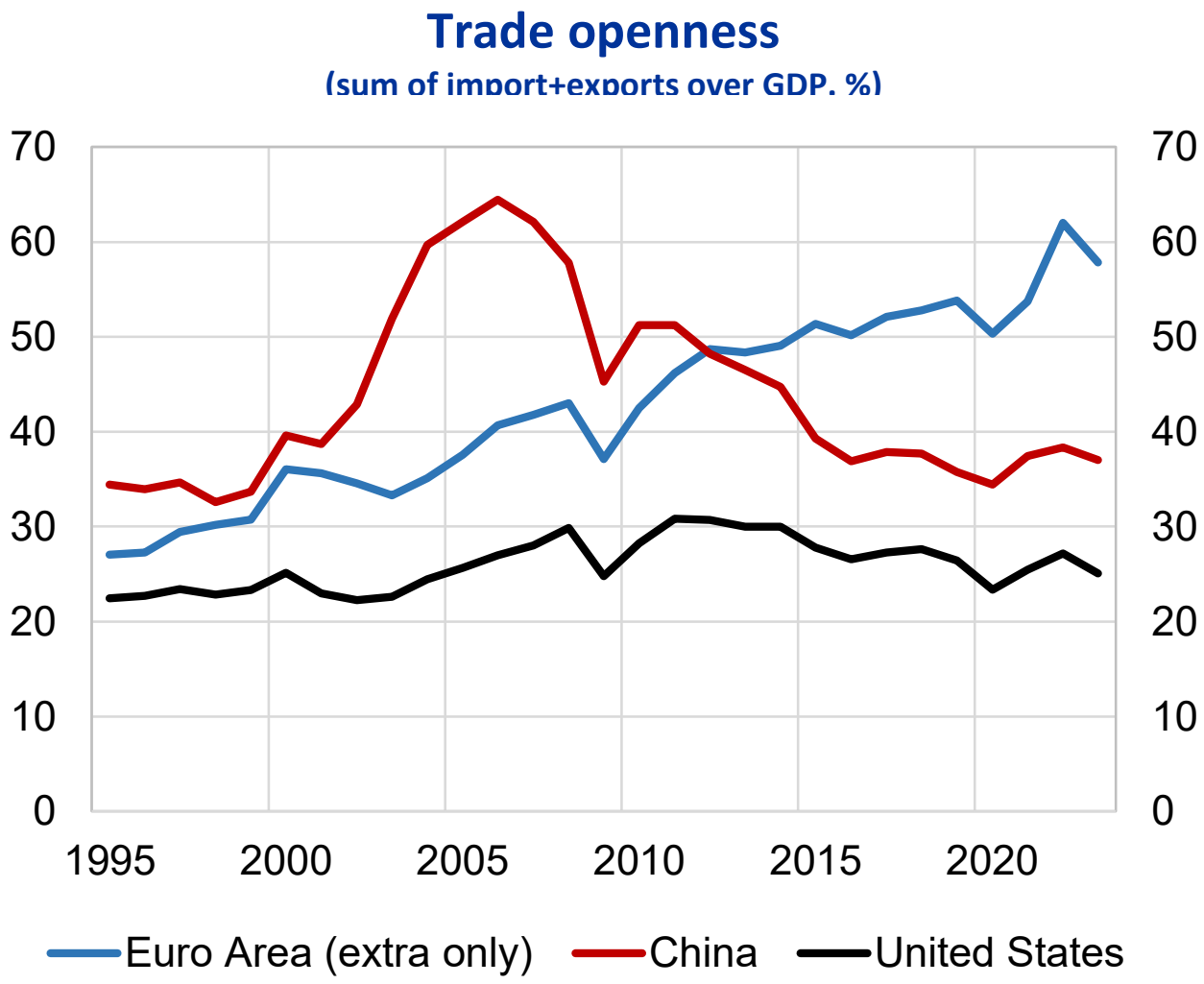
The contribution of GVC to globalization

(contribution to the variations of the long term income elasticity of trade)



Source: elaborations on World Bank, OECD, IMF WEO, Asian Development Bank MRIO data.

‘Normalization’ of China significantly contributed to slowbalization



Source: IMF WEO

From slowbalization to looming fragmentation

A tale of three shocks

1. **Discontent with globalization** has been growing, leading to **inward looking policies** (Brexit, CN-US tariff war, etc.)

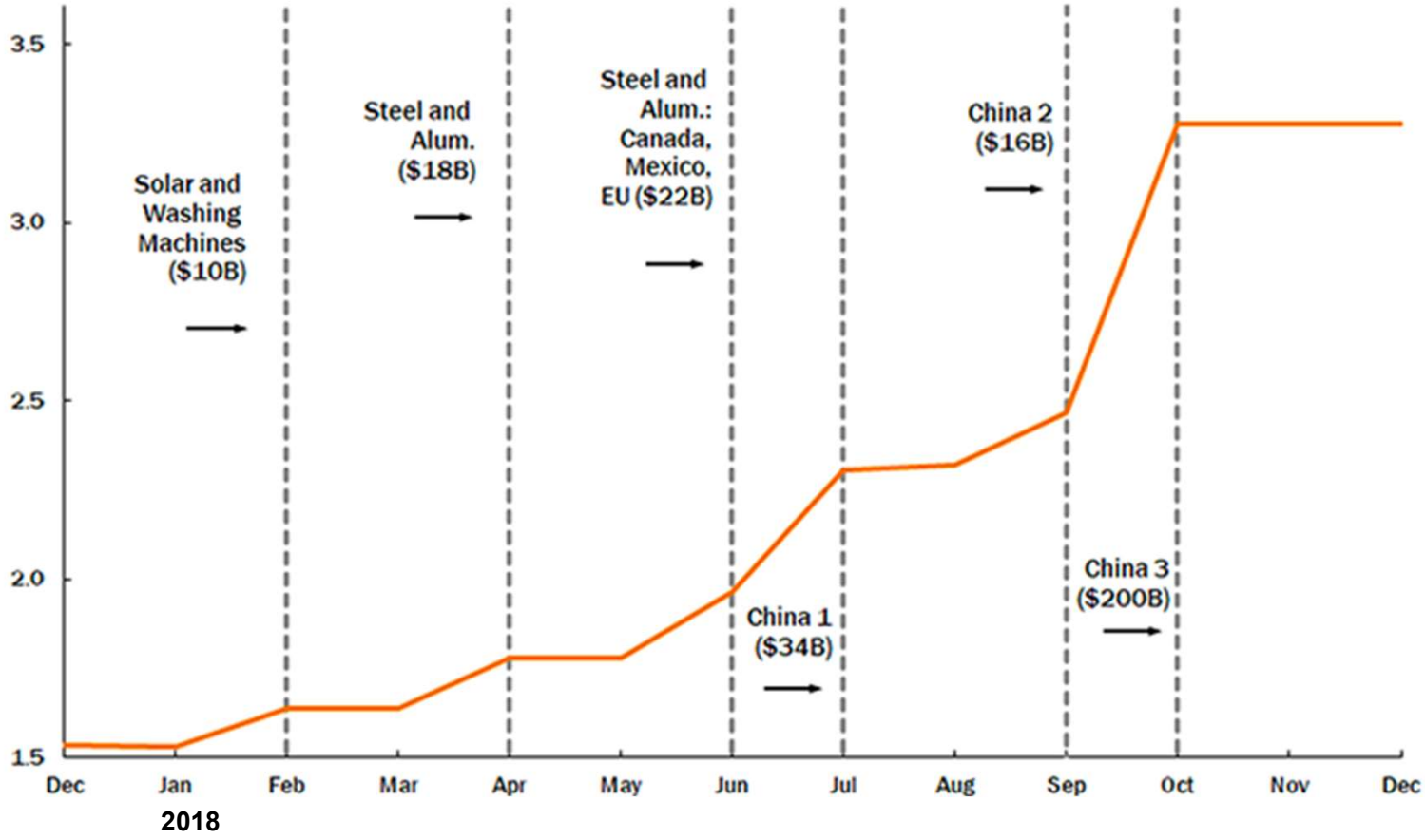
2. **The pandemic**

3. **The war in Ukraine** and **geopolitical tensions** have increased concerns about ***economic and national security***

Trump Tariffs: the resurgence of protectionism

Average ad valorem US tariffs

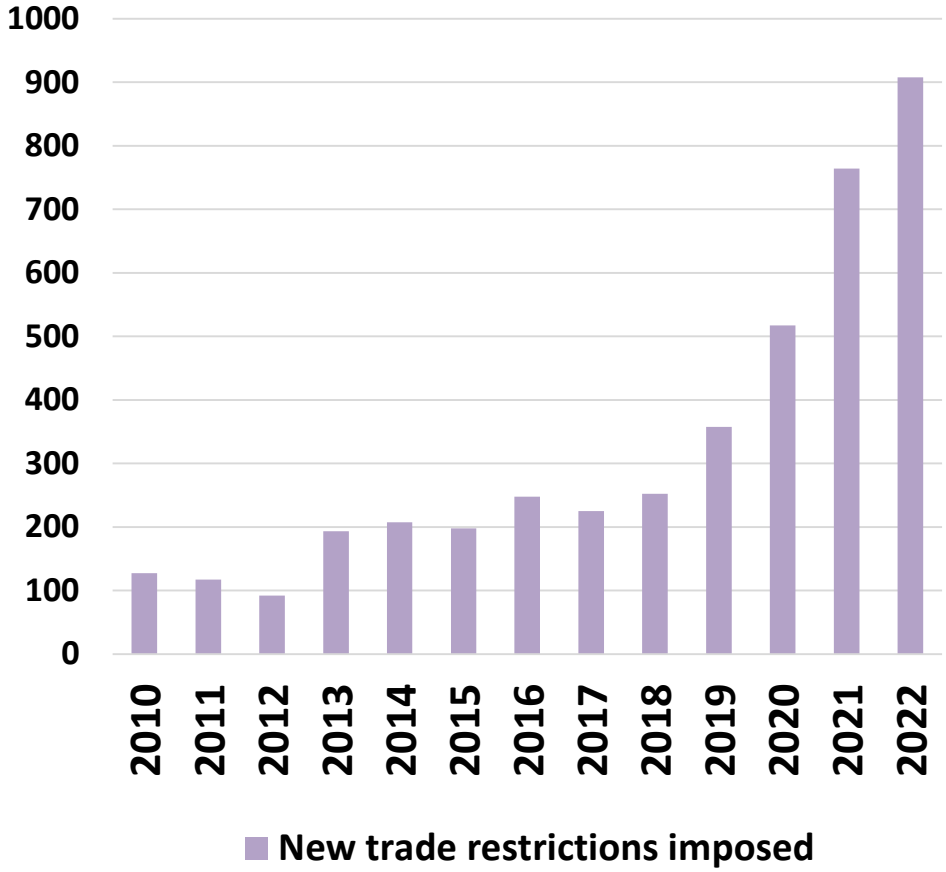
(share of respondents)



Source: Princeton University,

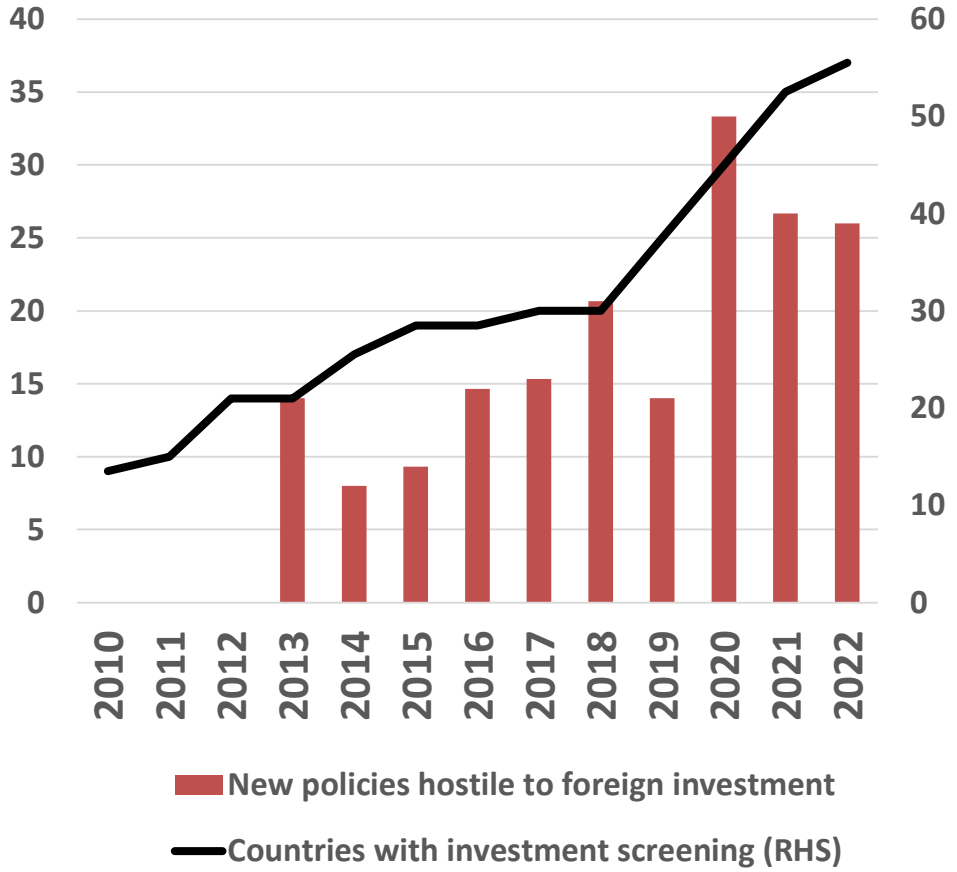
Since then, barriers to trade and investment are steadily increasing

Trade restrictions imposed
(number of new measures)



Source: Global Trade Alert.

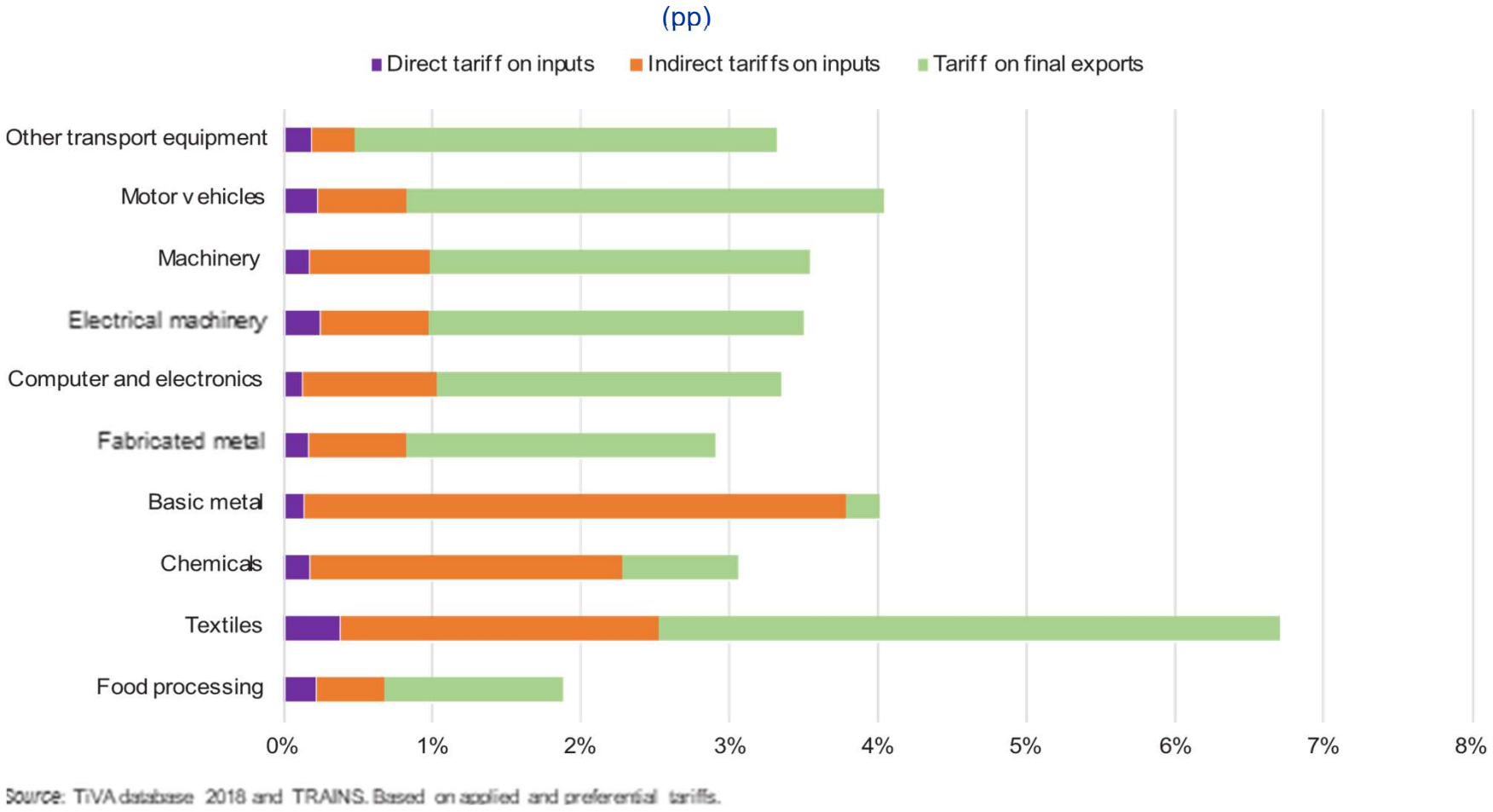
Barriers to inward FDI
(number of measures, number of counties)



Source: UNCAD, Bank of Italy staff elaborations.

Trade barriers are particularly harmful for GVC-trade

Average ad valorem tariff along the value chain



Source: OECD,

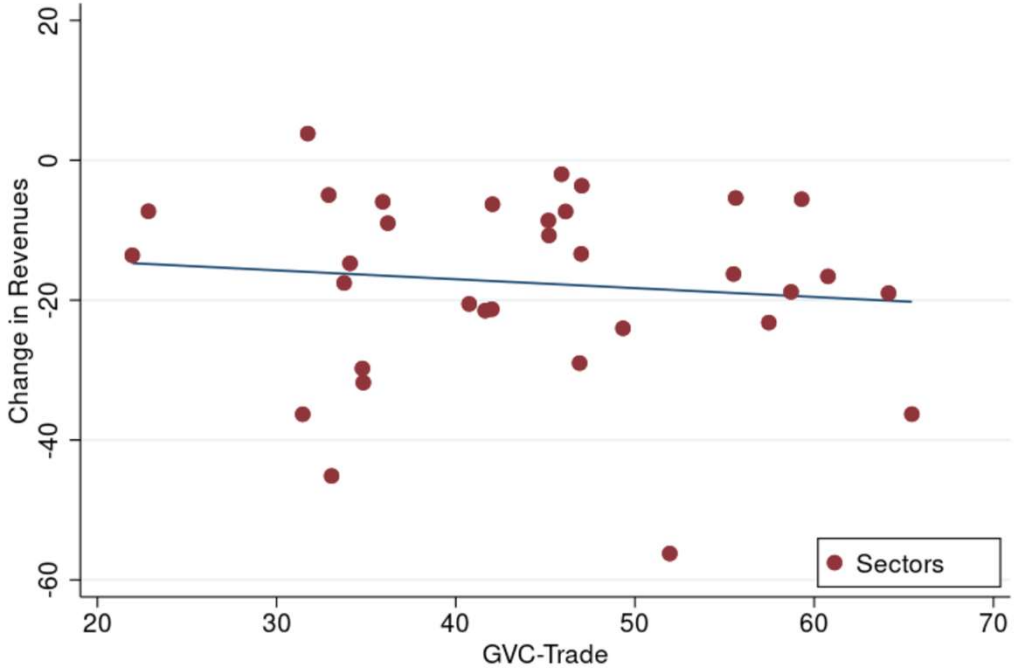
Covid-19 pandemics put a strain on GVCs

Source: Federal Reserve Bank of New York,

But trade and GVC proved quite resilient, limited evidence of reshoring

GVC participation and sectoral revenues change during the pandemic

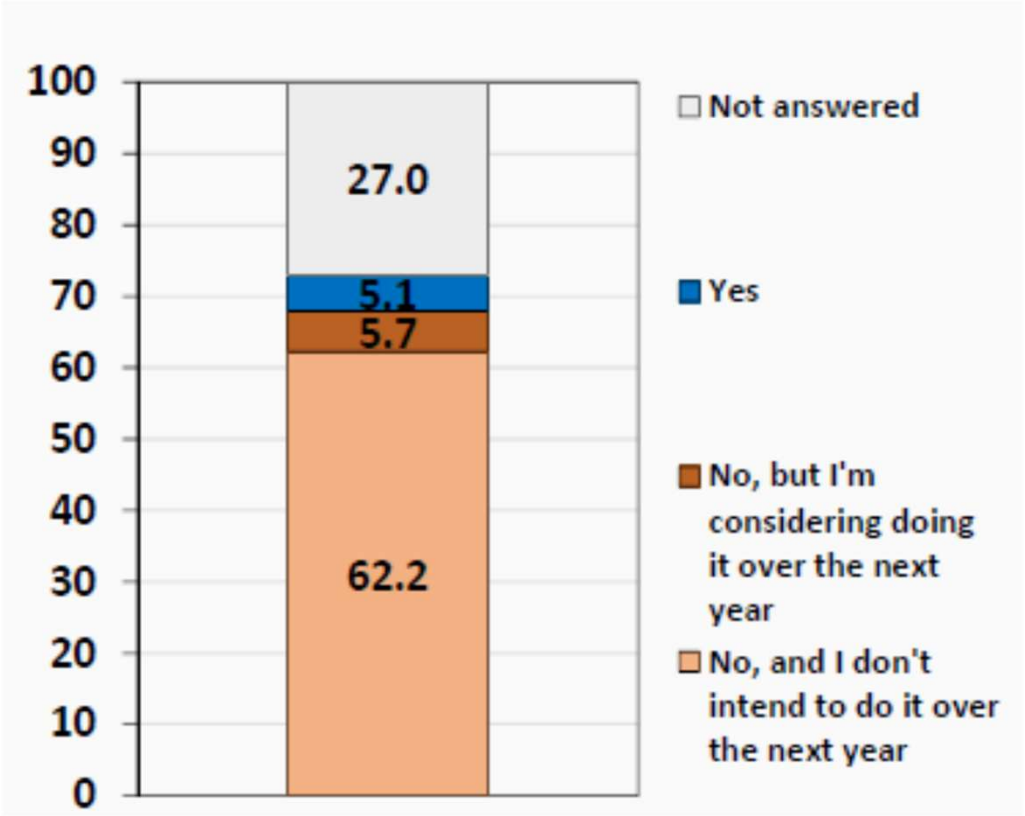
(change in revenues in 2020Q1-Q2 over the previous six months vs GVC in 2019)



Source: Our elaborations on data from EIKON and World Bank GVC.

Probability of reshoring after Covid-19

(Italian MNEs, share of respondents)



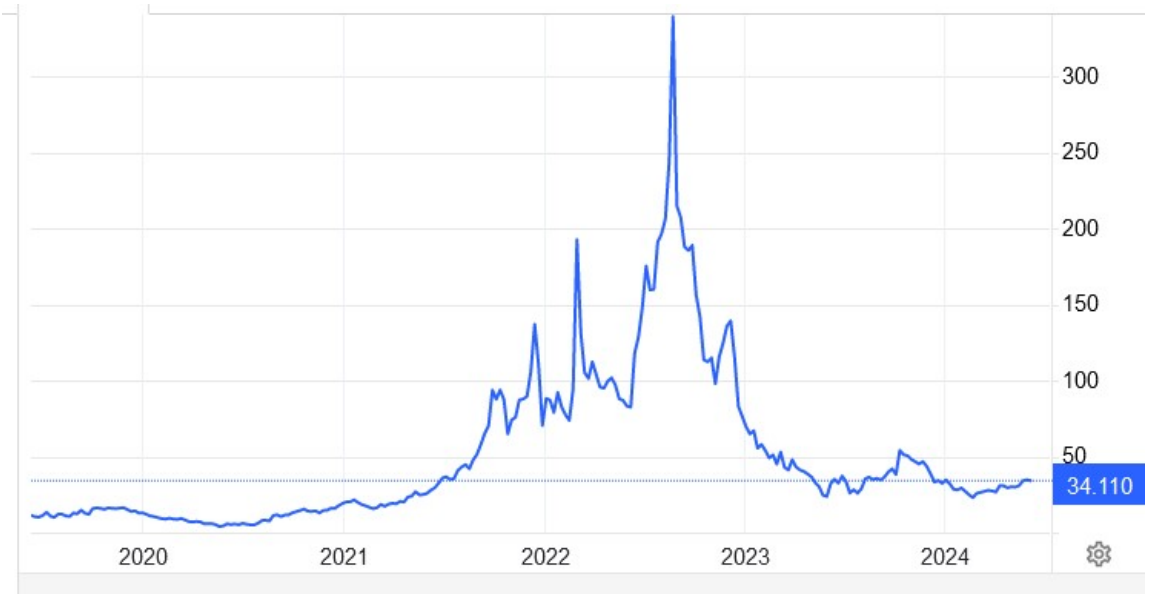
Source: Bank of Italy

→ **Sunk costs** matter when shocks are perceived as temporary (Di Stefano et al. 2021)

Russia invasion showed the effect of a weponization of interdependences

Natural Gas EU Dutch TTF

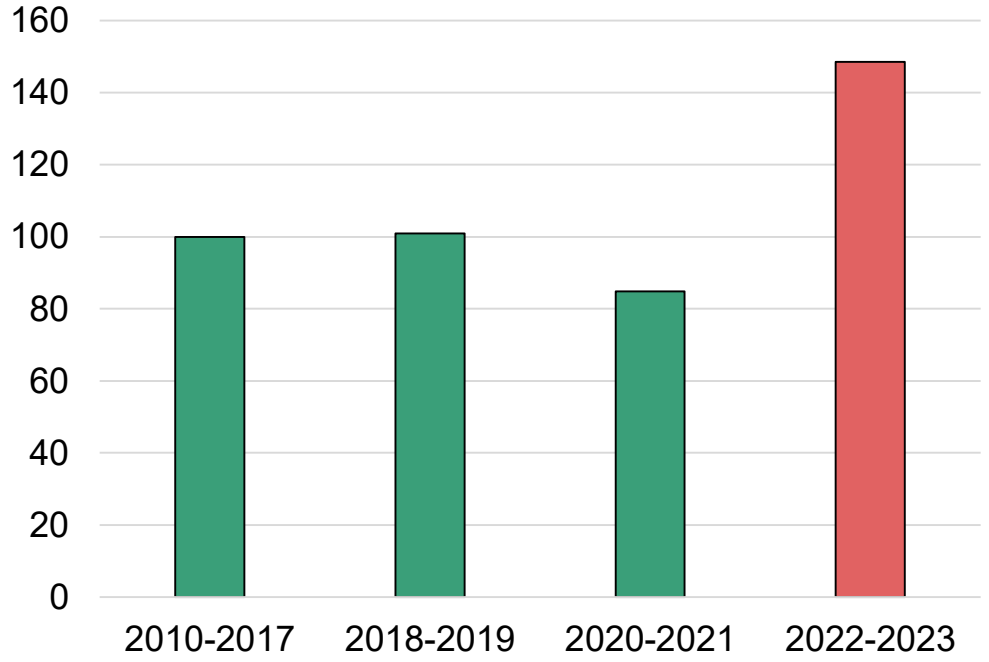
(UR/MWh)



Sources: https://tradingeconomics.com/commodity/eu-natural-gas

Geopolitical risk

(index, media 2010-2017=100)

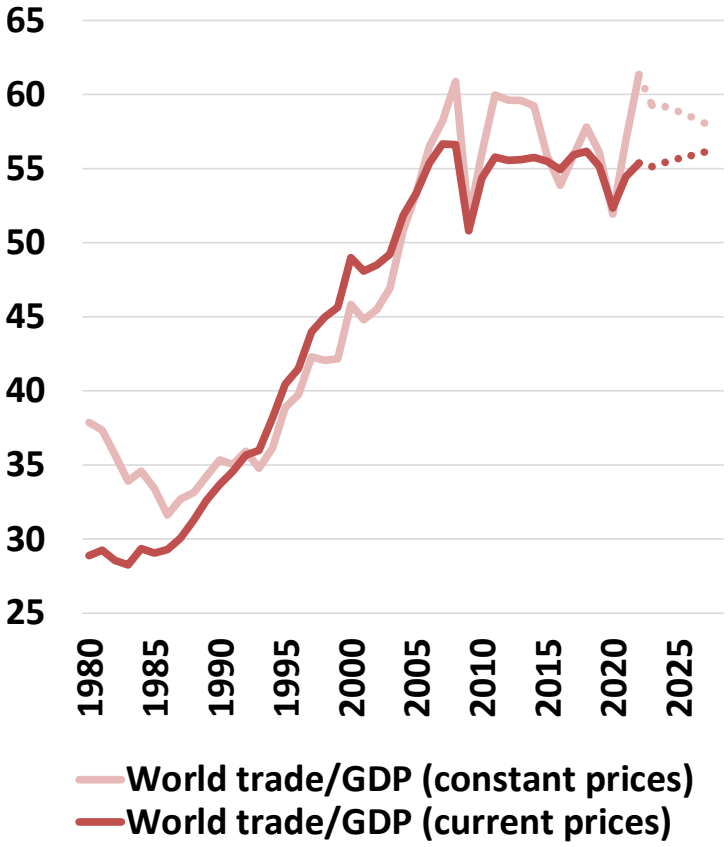


Sources: Bank of Italy staff elaboration based on Caldara, Iacoviello, GPR Index. Note: frequenza di articoli su eventi geopolitici negativi.

Overall still more slowbalization than deglobalization

Trade Openness

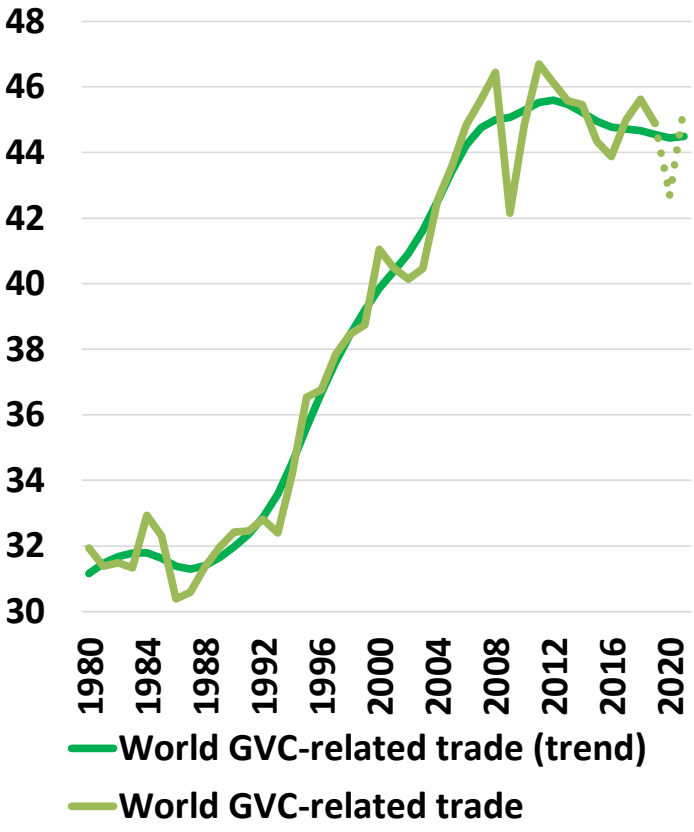
(Sum of exports and imports, % of GDP)



Source: Bank of Italy staff calculations based on IMF data.

GVC participation

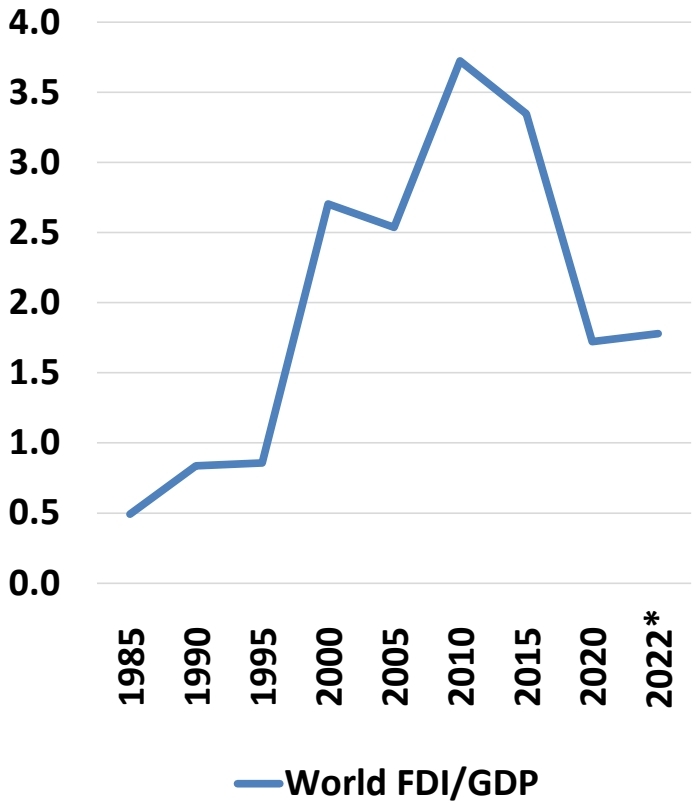
(GVC-related trade, % of global trade)



Source: Bank of Italy staff elaboration based on ADB and WIOD Long Run data and Borin, Mancini, Taglioni, 2022, Measuring exposure to Risk in Global Value Chains, World Bank Working paper.

Foreign Direct Investments

(global FDI flows, % of GDP, 5 yrs average)



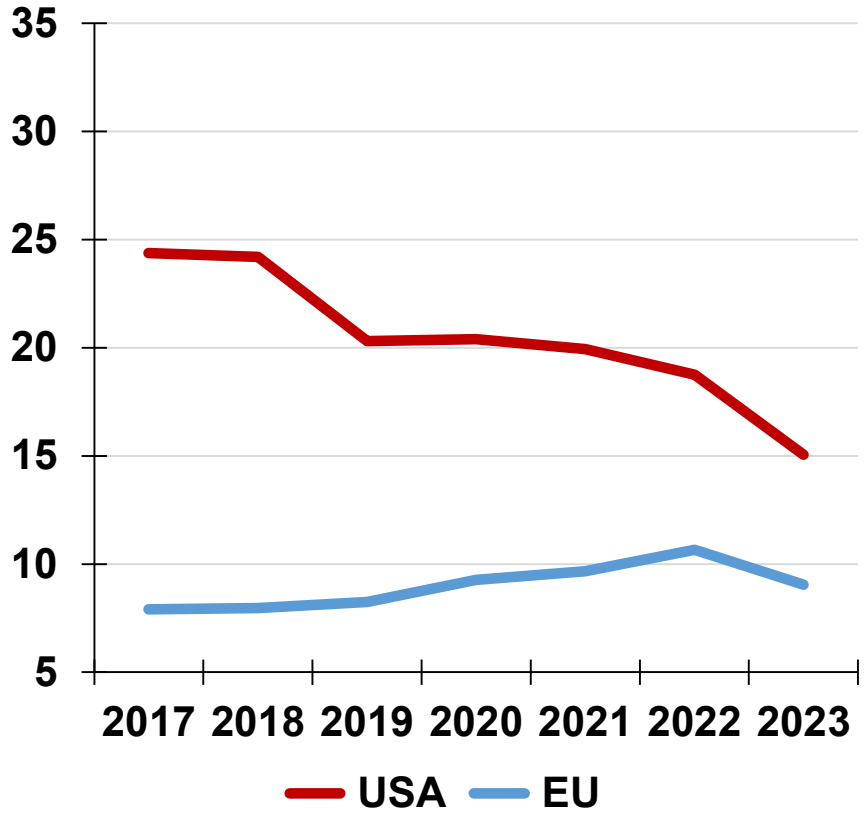
Source: Bank of Italy staff calculations based on IMF data.
*2021-'22 average

But with increasing signs of selective decoupling

China's market share in US and EU imports

All goods

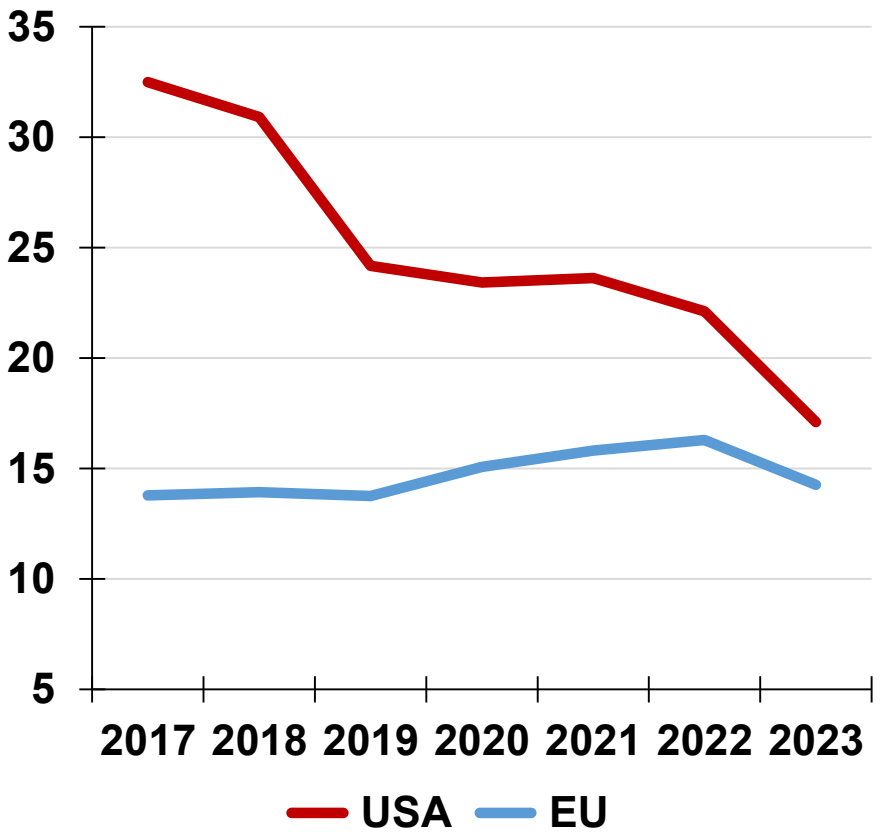
(imports from China, % share of total)



China's market share in US and EU imports

Advanced Technology products

(imports from China, % share of total)

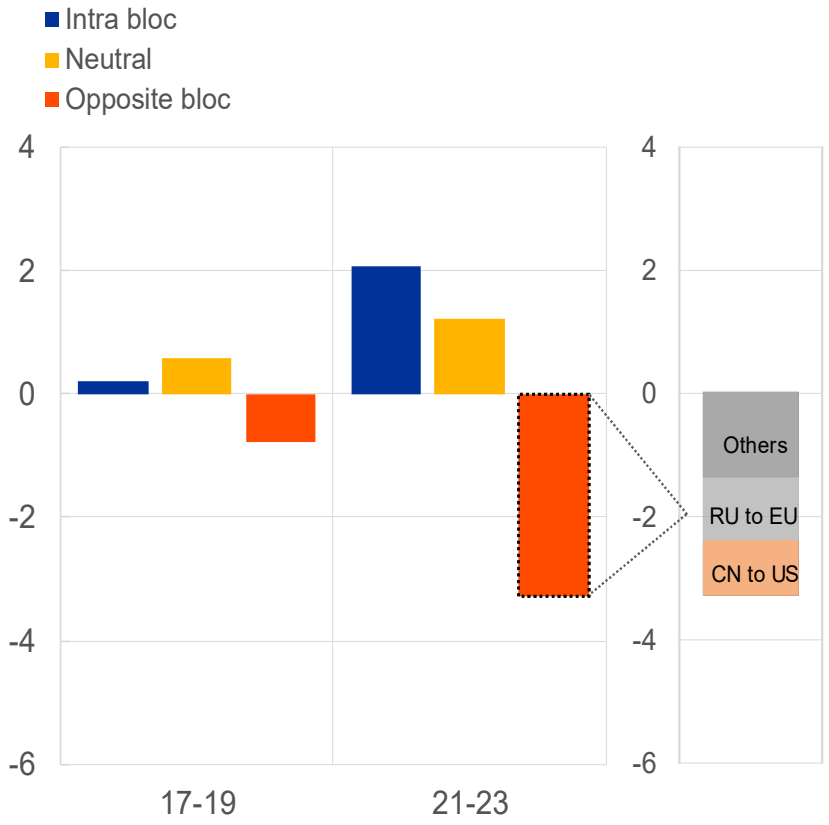


Source: TDM, national customs, Bank of Italy calculations.

Signs of reconfiguration of trade flows along geopolitical lines

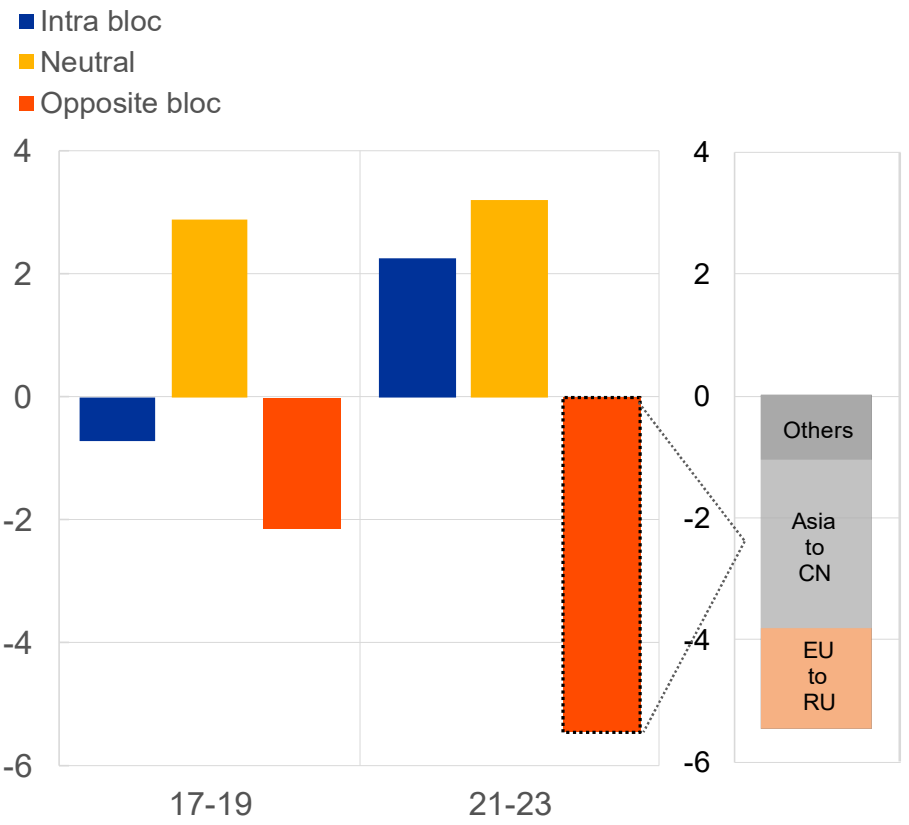
West bloc import shares

(p.p. change)



East bloc import shares

(p.p. change)

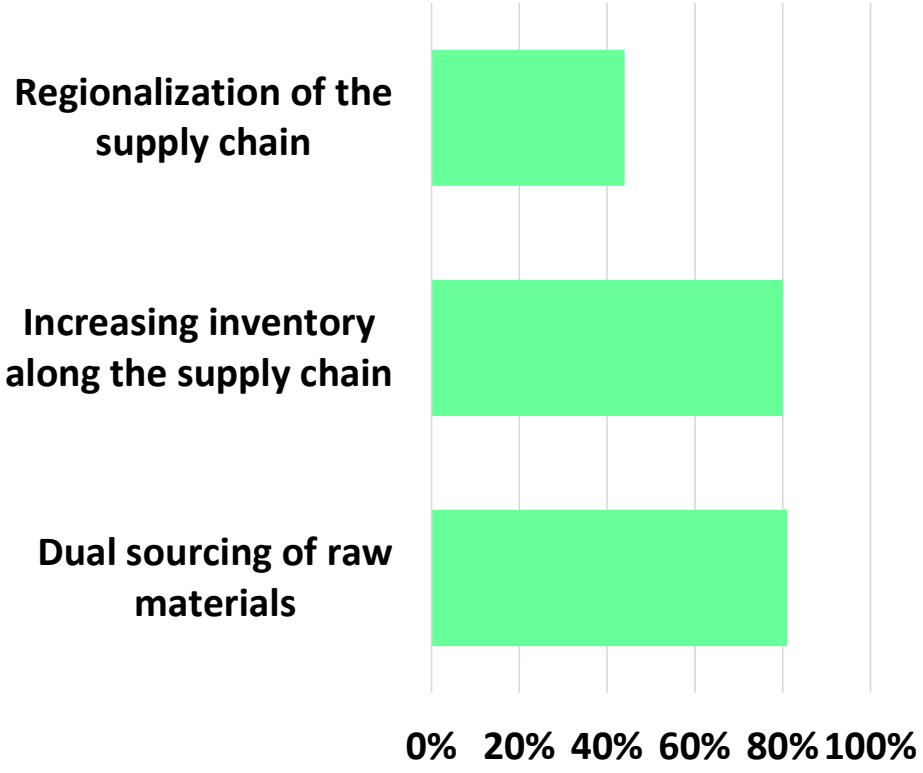


Source: TDM, Conteduca et al. (2024).

Firms are taking actions to cope with risks from supply and fragmentation

Companies' strategies to boost supply-chain resilience

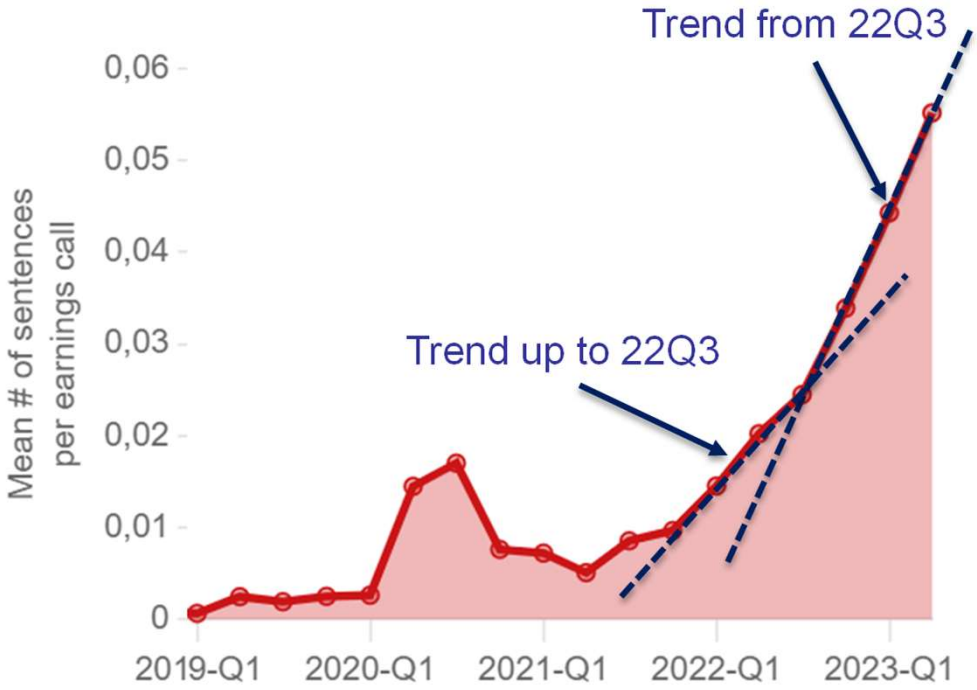
(implemented in May '21-April '22, per cent of respondents)



Sources: McKinsey survey of global supply-chain leaders.

"Reshoring", "onshoring", and "nearshoring" mentions in earnings calls

(number of mentions per earnings call)

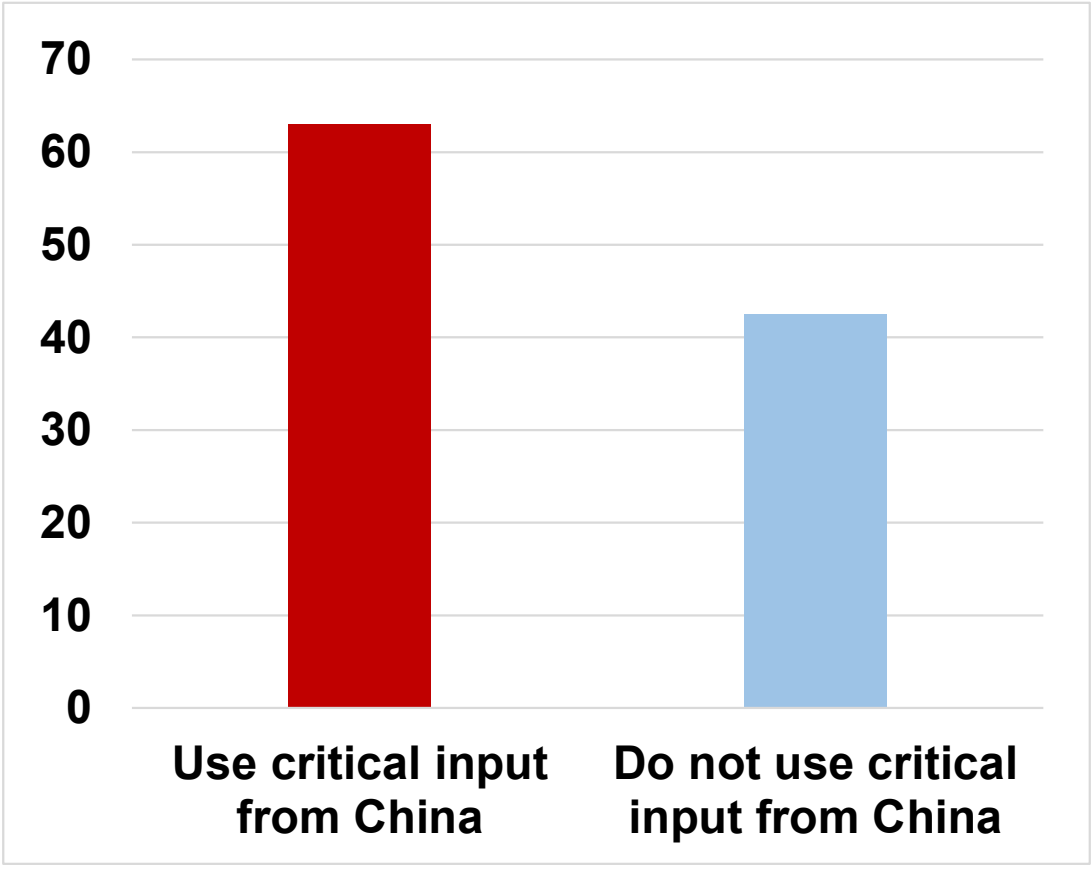


Sources: Bank of Italy staff elaboration based on NL analytics data.

…especially those exposed to China

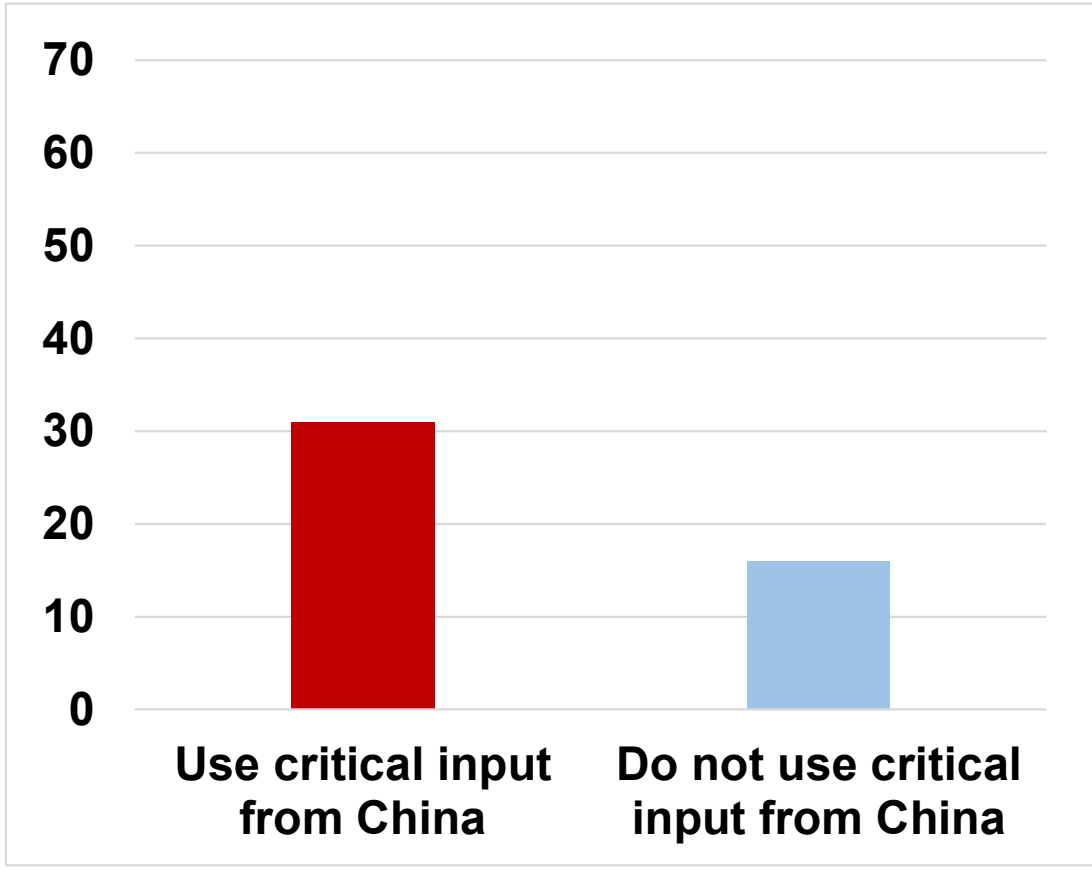
Firms diversifying suppliers, by exposure to inputs from China

(% share of Italian manufacturing firms)



Firms re-/near-shoring suppliers, by exposure to inputs from China

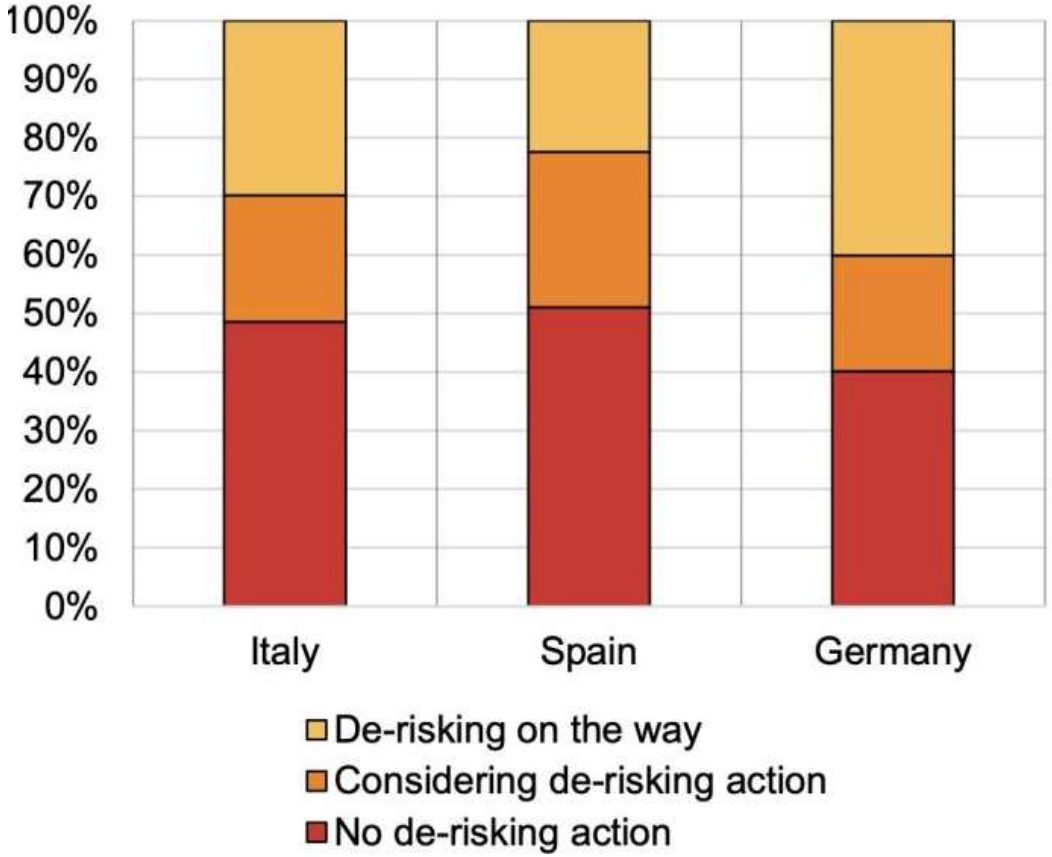
(% share of Italian manufacturing firms)



Source: Bottone, Padellini and Mancini (2023), Bank of Italy Survey of Industrial and Service Firms.

EU firms are de-risking from China, mainly via EU-shoring of suppliers

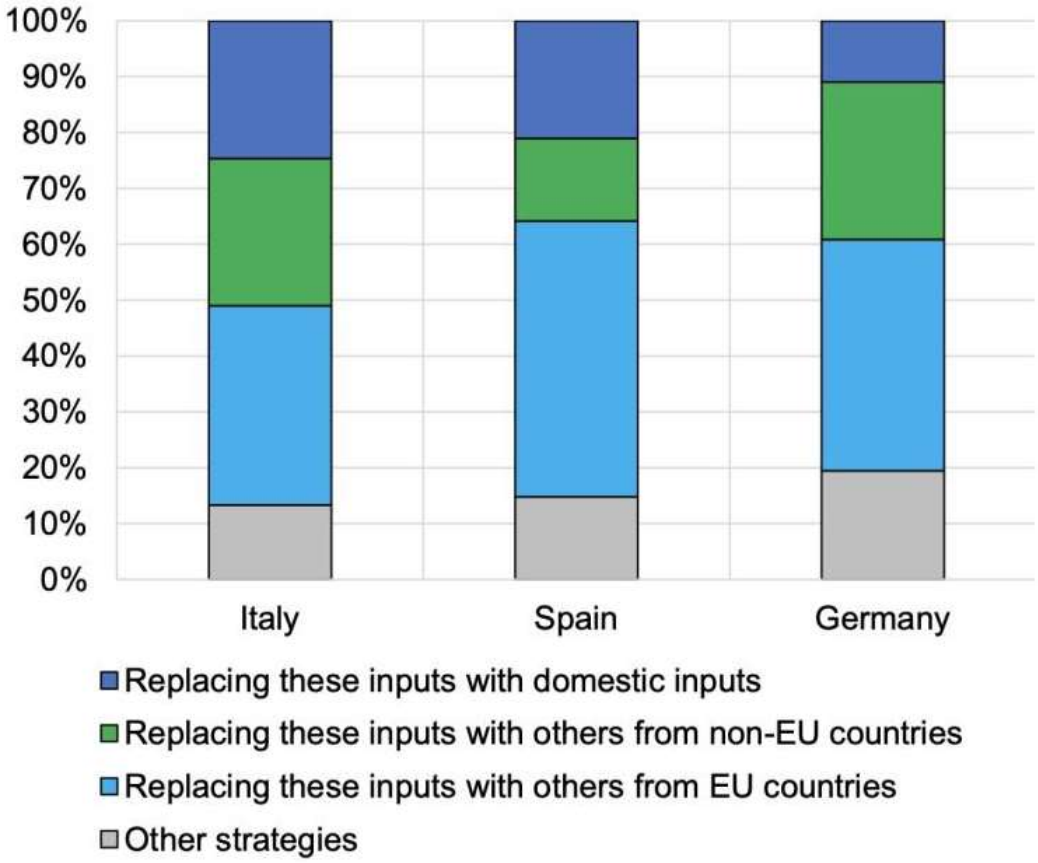
Manufacturing firms relying on Chinese inputs deemed as critical for their activity, by action taken to de-risk



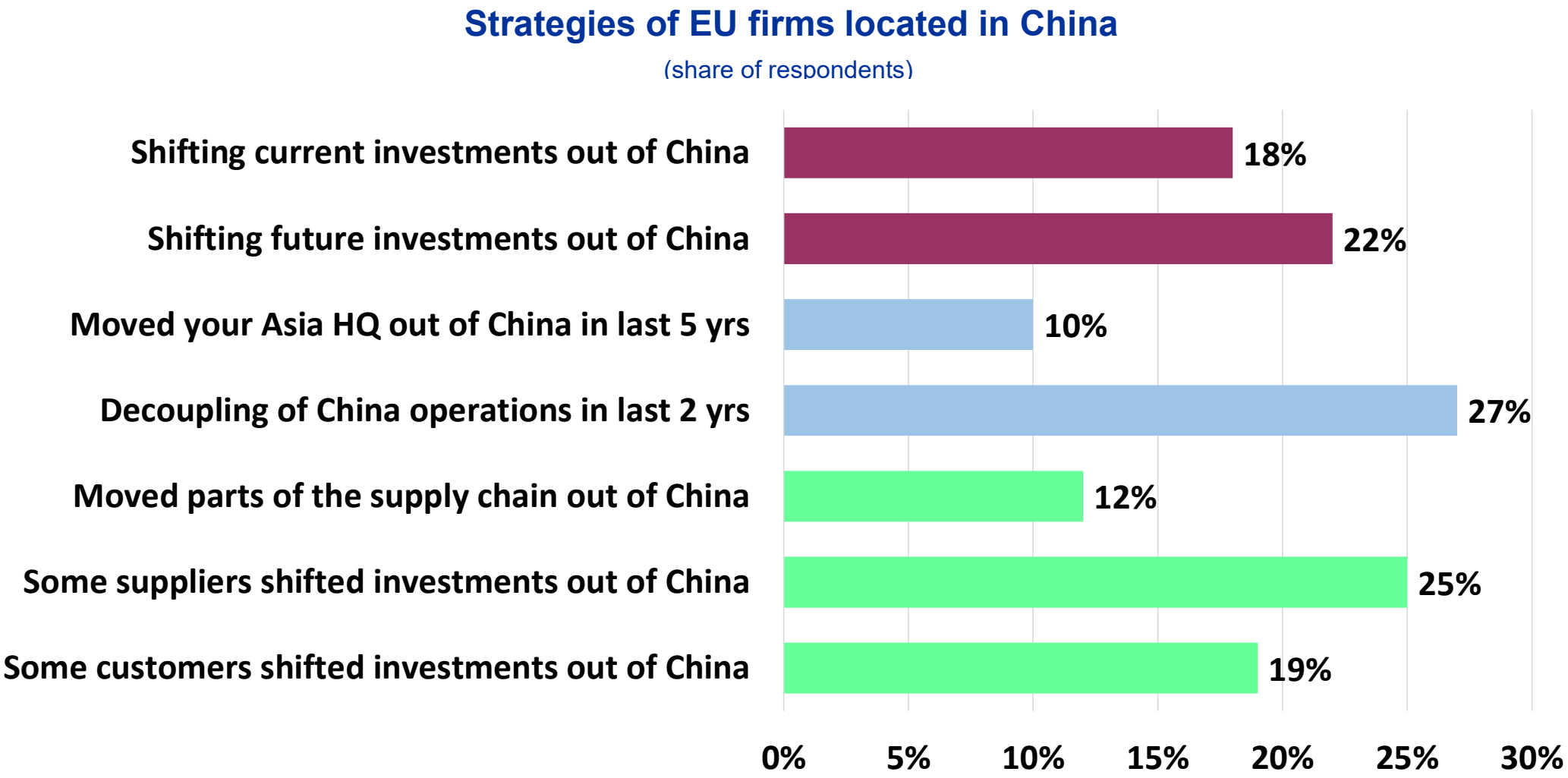
Source: Banca d'Italia, Deutsche Bundesbank and Banco de España.

Manufacturing firms exposed to China and implementing de-risking strategies, by strategy

(percentage)

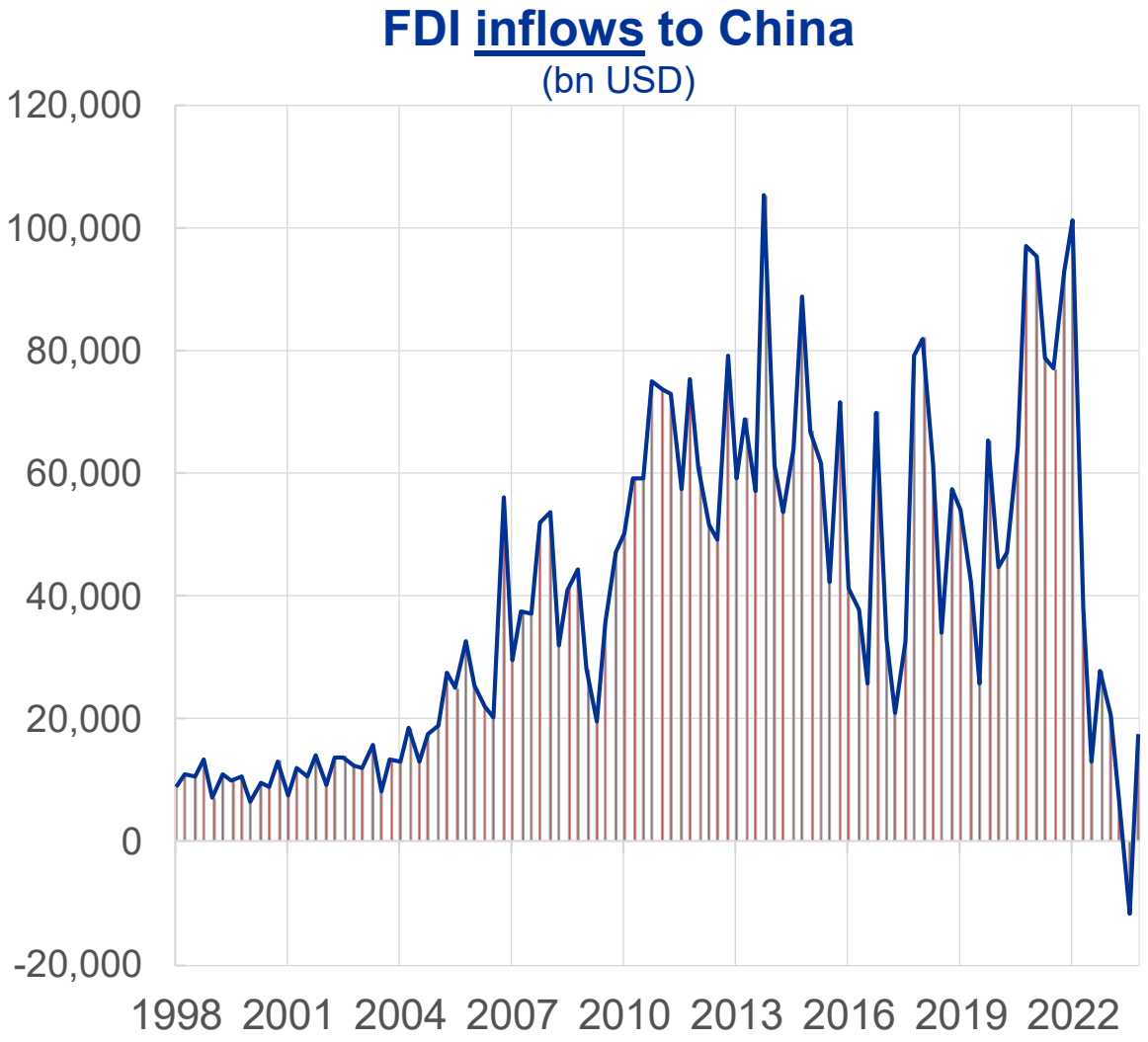


Decoupling signs are evident among western firms located in China



Source: European Union Chamber of Commerce in China

FDI to China dropped after the pandemic

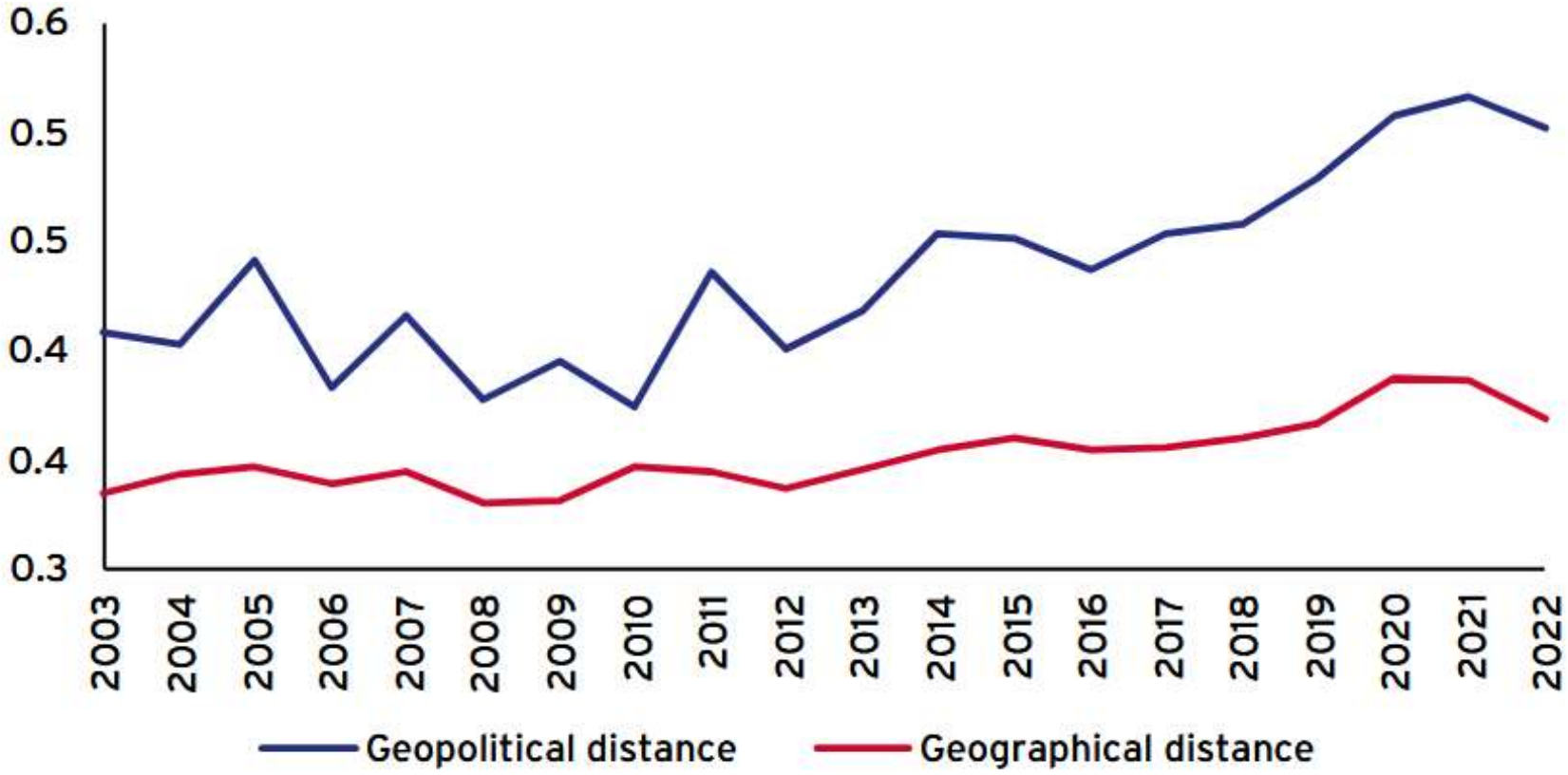


Source: China SAFE.

The importance of geopolitical distance for FDI has increased

FDI BETWEEN GEOGRAPHICALLY AND GEOPOLITICALLY CLOSE COUNTRIES

(bn USD)



Source: Sources: Bailey et al. (2017); Centre d'etudes prospectives et d'informations internationals, Gravity database, fDi Markets; IMF staff calculations.

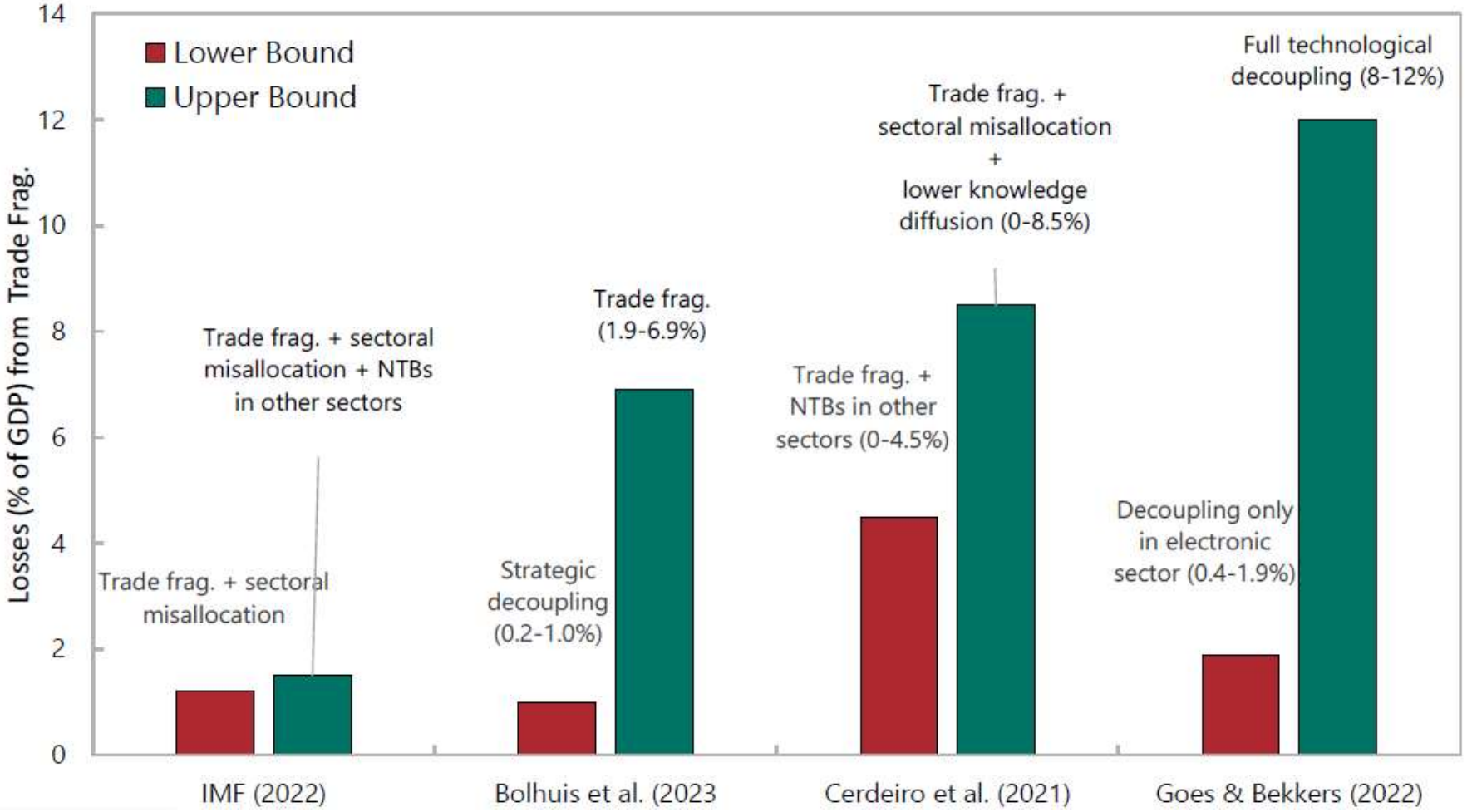
Note: Figure shows the annual share of total FDI between country pairs that are similarly distant (i.e. in the same quintile of distance distribution), geopolitically and geographically, from the United States.

What are the potential effects of geoeconomic fragmentation?

Macro effects of fragmentation may be sizeable but hard to predict

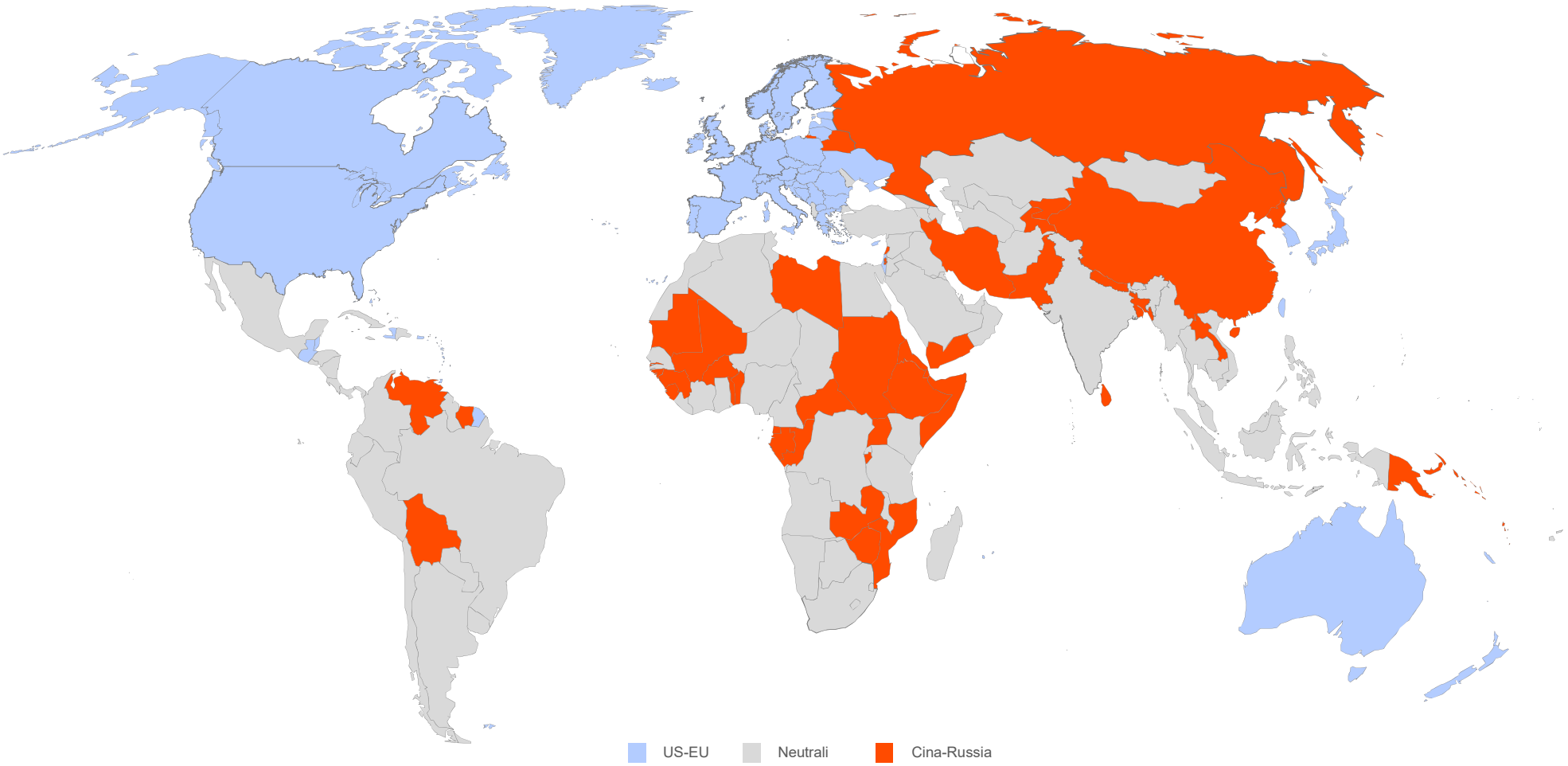
Global Long-Term Losses from Fragmentation

(GDP or Expenditure Losses)



Source: IMF.

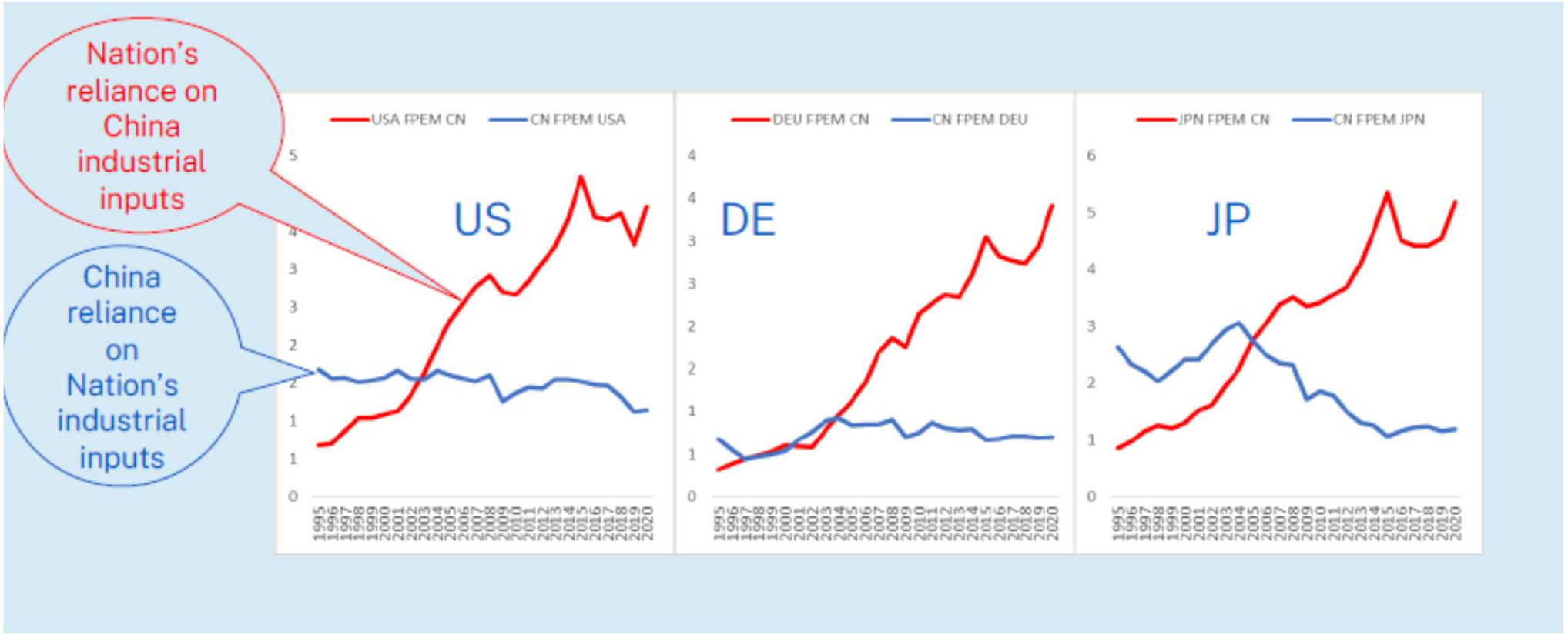
Hypothesis on countries' allocation to different blocs is important



SourceIRC task force elaborations based on den Besten et al. (2023) and Capital Economics.

Dependency on China’s inputs has increased

FPEM: import-side exposure normalized by purchases from all sources

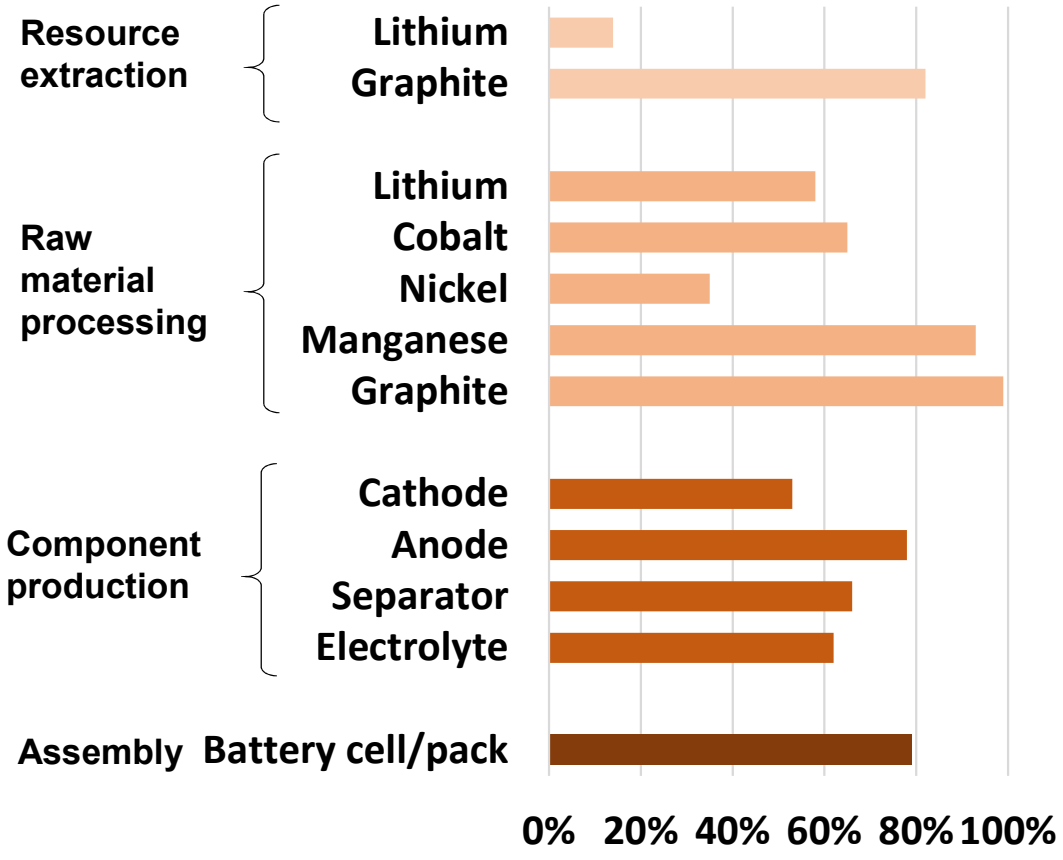


Source: R. Baldwin elaboration of OECD TiVA database 2023, left and right charts based on FPEM (total manufacturing).

China plays a key role in strategic productions

China's market share in EV batteries

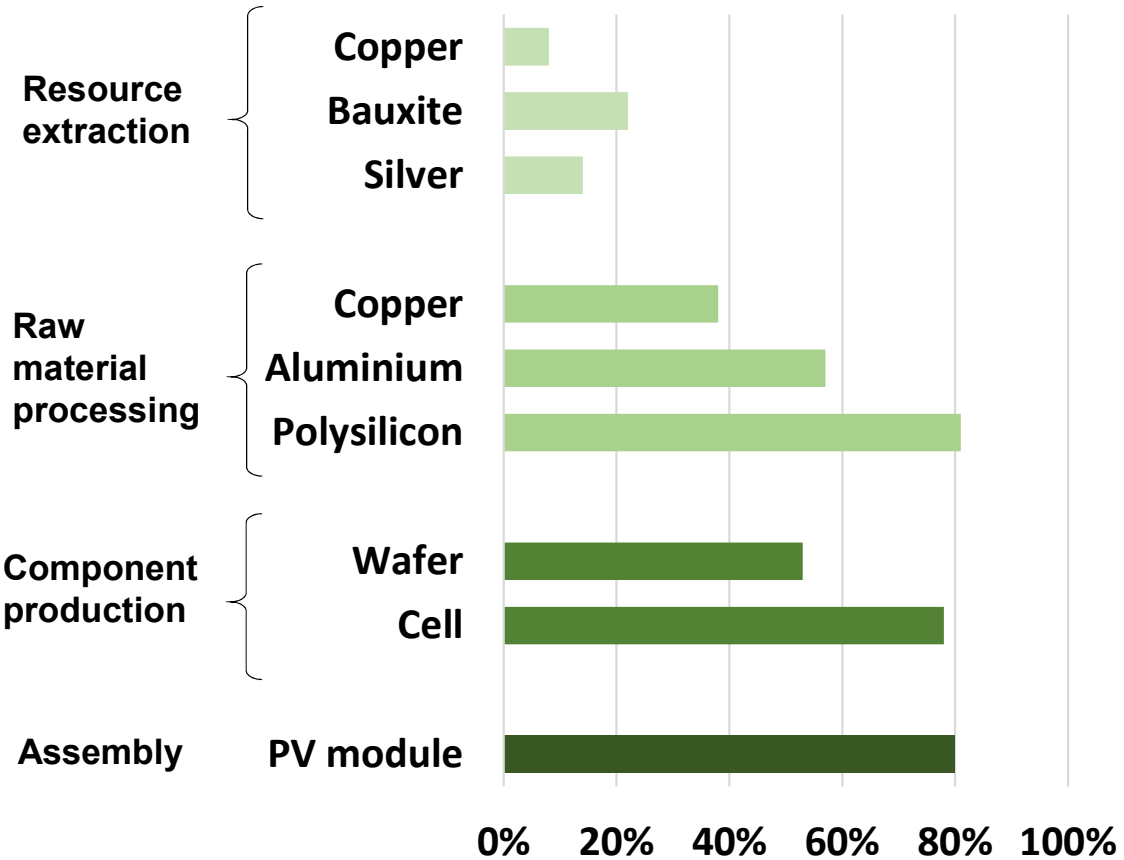
(share of global production)



Source: Bank of Italy calculations based on OECD data.

China's market share in solar PV panels

(share of global production)

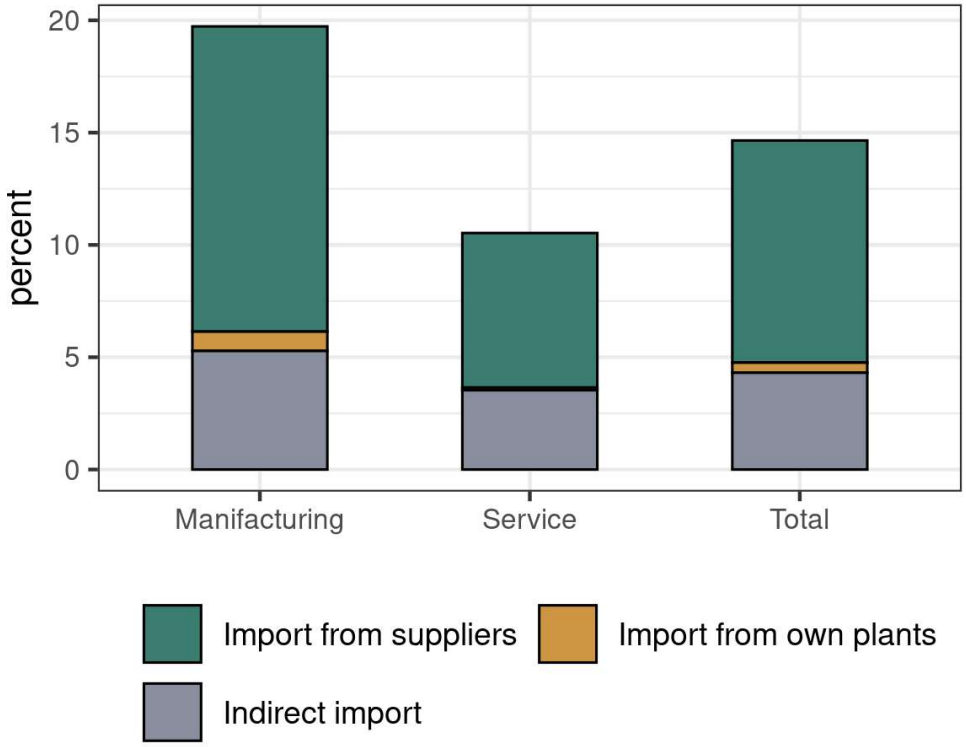


Source: Bank of Italy calculations based on OECD data.

15% of Italian firms currently relies on Chinese critical inputs

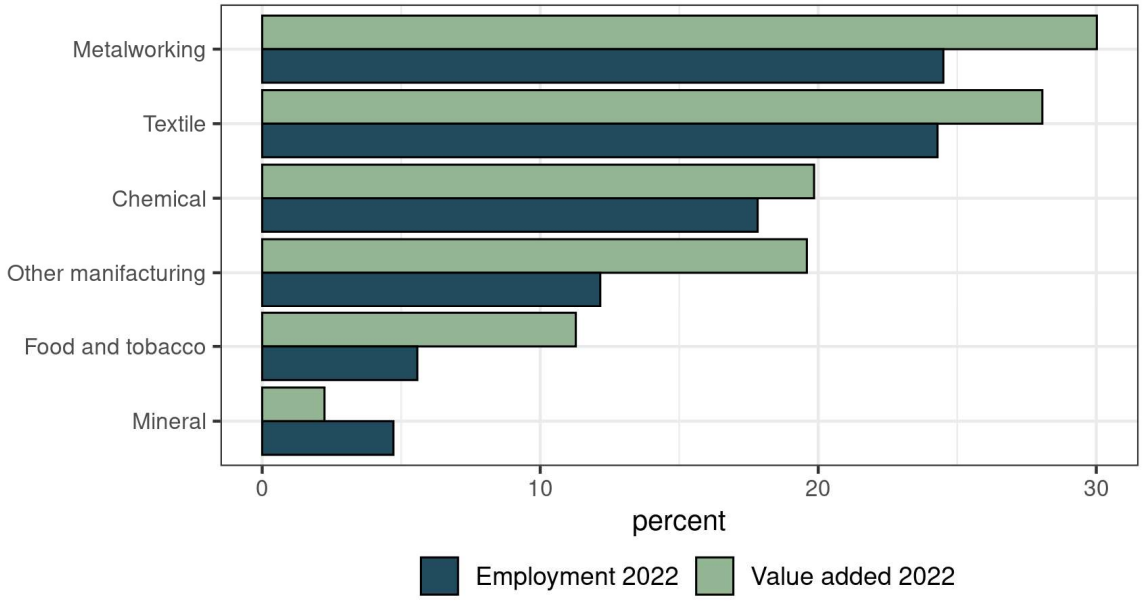
Firms sourcing critical inputs from China

(share of total firms)



Exposure to critical inputs from China

(share of sectoral employment/value-added)

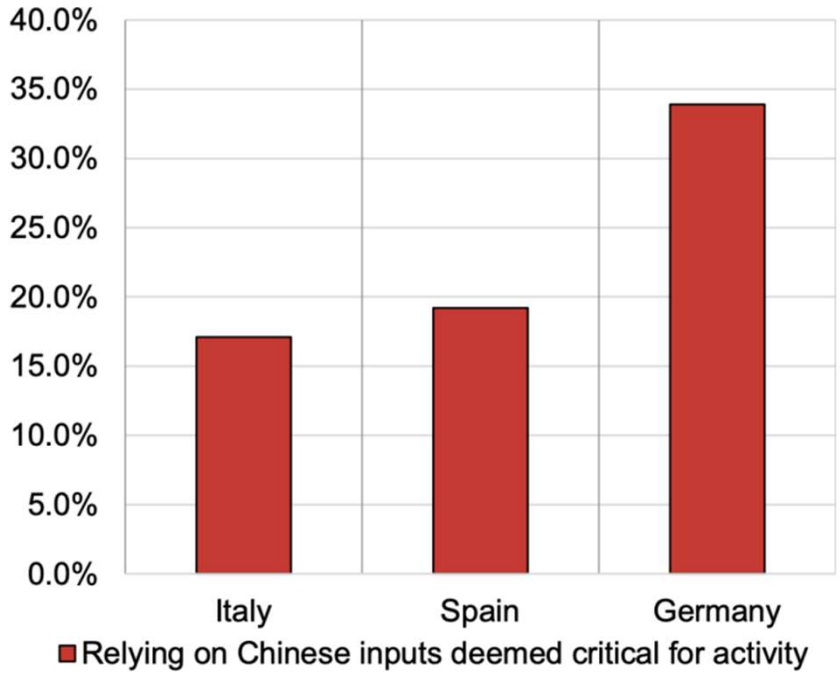


Source: Bottone, Mancini, Padellini, 2023, Navigating Fragmentation Risks: China Exposure and Supply Chains Reorganization among Italian Firms, forthcoming. Evidence based on the Bank of Italy Survey of Industrial and Service Firms conducted in spring 2023.

Exposure to China varies across EU countries

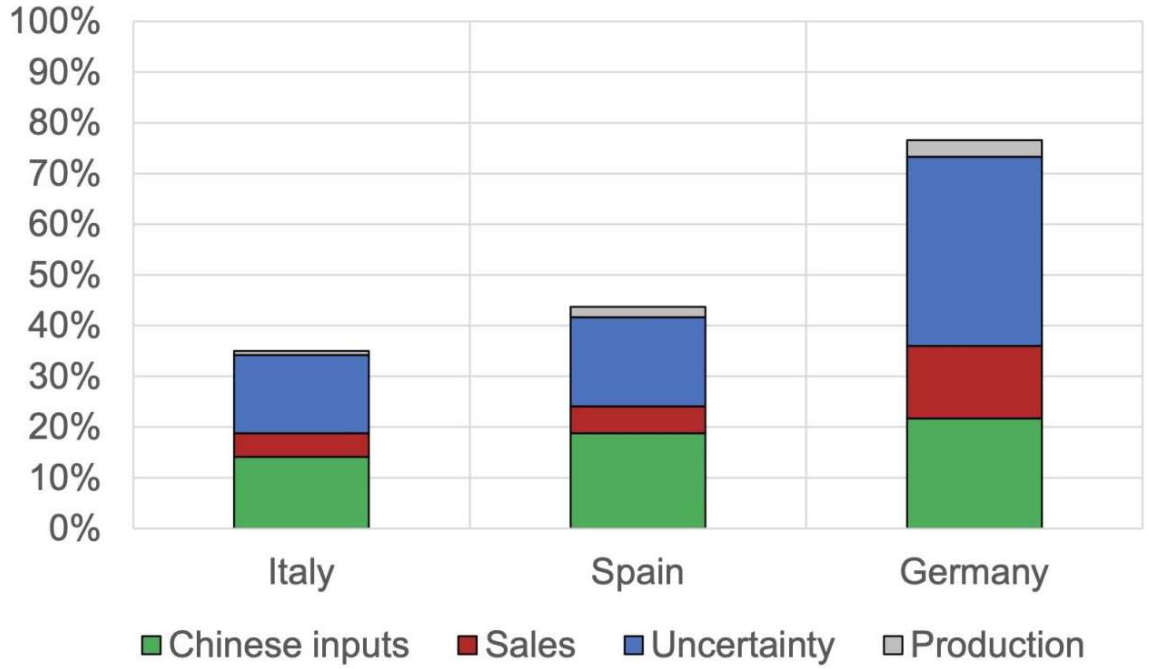
Companies sourcing critical inputs from China

(percentage of manufacturing companies)



Companies indicating a potentially negative impact from fragmentation

(percentage of manufacturing companies)



Source: Banca d'Italia, Deutsche Bundesbank and Banco de España. https://cepr.org/voxeu/columns/european-firms-facing-geopolitical-risk-evidence-recent-eurosystem-surveys

An exercise to evaluate the effects of possible supply disruptions

"Inputs in geopolitical distress: a risk assessment based on micro data"
by Borin, Cariola, Gentili, Linarello, Mancini, Padellini, Panon and Sette

https://www.bancaditalia.it/pubblicazioni/qef/2023-0819/QEF_819_23.pdf?language_id=1

1. Identify a list of vulnerable products at a granular level (CN8) for Italy

2. Simulate the impact of reducing imports from high-risk countries on manufacturing value-added

- Leverage on foreign transactions from customs, firm-level balance sheet information

Identifying Foreign Dependent Products (FDP): methodology

- Rely on European Commission (2021), IRC Work stream on Open Strategic Autonomy (2023):
  1. High concentration of imports from a supplier country

     Herfindahl index > 0.4
  2. High import share from non-EU countries

     Ratio > 0.5
  3. Difficulty in substituting imports with goods produced in EU countries

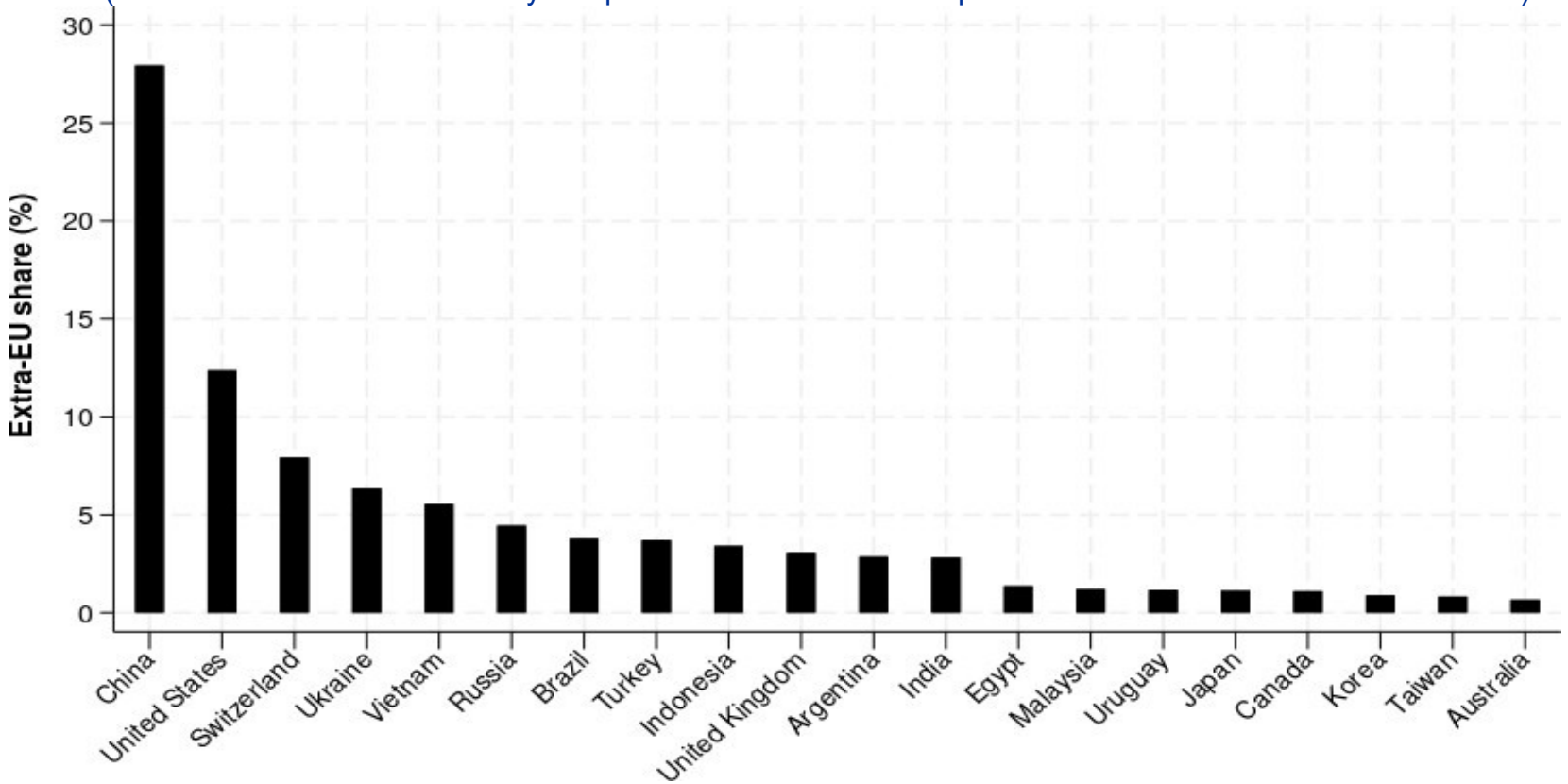
     Import-to-export ratio > 1
- Add two other criteria:
  - Imported value > 1M €
  - Do not consider energy commodities

China stands out as potential source of vulnerability

We identify **515 FDPs** (CN-8 digit), equal to 7% of total imports from extra-eu.

Extra-EU Import Share of FDPs by Country

(share of each extra-EU country's exports of FDPs in Italian imports of FDPs from all extra-EU countries)



Source: Borin, Cariola, Gentili, Linarello, Mancini, Panon, Sette, 2023, *Vulnerable Inputs in Geopolitical Distress: Stress-Test Analysis based on Micro Data, Bank of Italy Occasional Paper Series.*

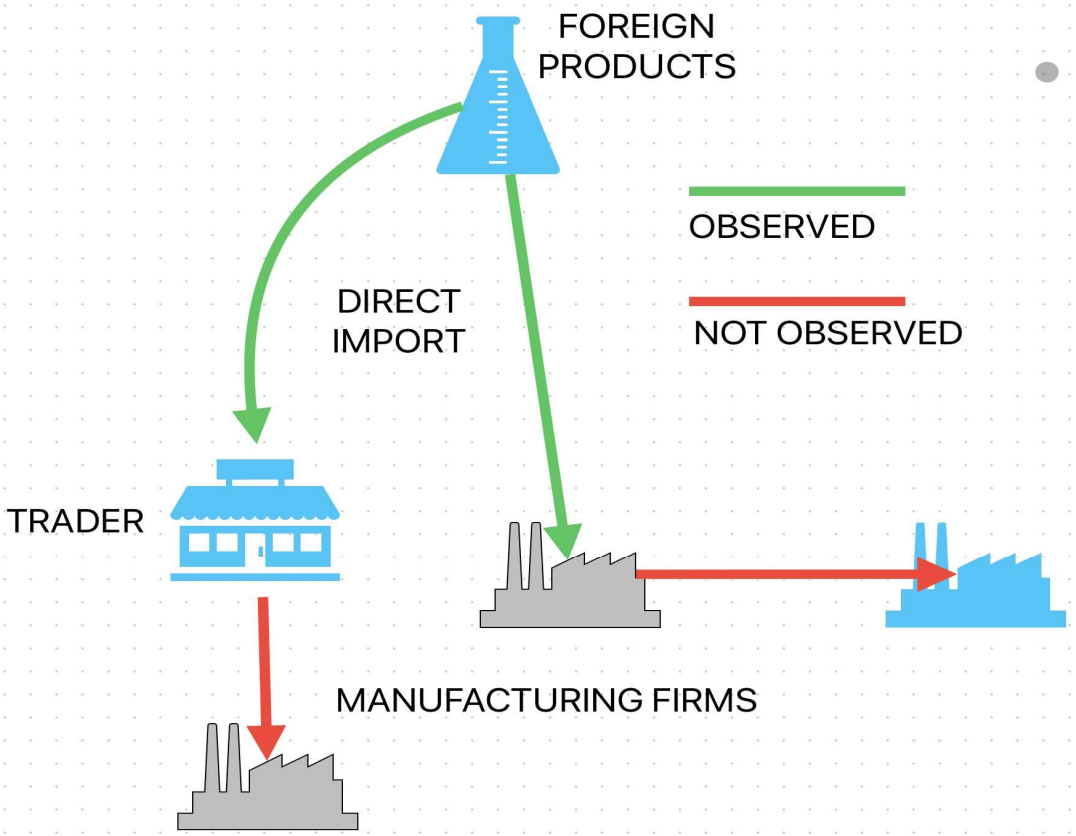
FDPs and Firm Characteristics

Using Custom micro-data we match FDPs to about 17,000 firms with balance sheet info.

Stylized facts on FDPs' importers:

1. Firms importing FDPs are important ⇒ account for 31% of value added
2. FDPs account for a modest share of firms' total purchases ⇒ on average 5%
3. Diversification is limited ⇒ median number of sourcing countries is 1
4. Firms importing FDPs are larger and more productive ⇒ +20% more productive
5. Small firms importing FDPs are less diversified ⇒ higher exposure

Computing the impact of a shortage of FDPs imports



- Cannot identify end-user sector. We use sector of the direct importer
- Wholesale and retail in particular should be taken with special care
- We cannot include in our analysis domestic transmission (second round, amplification effects)

Computing the impact of a shortage of FDPs imports: the model

A simple partial-equilibrium framework based on by Bachmann et al. (2022)

Each firm i produces output Y with a Cobb-Douglas technology, by combining labor (L), capital (K), and intermediates goods and services (M):

$$Y_i = A_i K_i^{\alpha_s} L_i^{\beta_s} M_i^{1-\alpha_s-\beta_s}$$

In turn, intermediate goods and services are combined through a firm-specific CES aggregator

$$M_i = \left[\gamma_i^{\frac{1}{\sigma}} E_i^{\frac{\sigma-1}{\sigma}} + (1-\gamma_i)^{\frac{1}{\sigma}} X_i^{\frac{\sigma-1}{\sigma}} \right]^{\frac{\sigma}{\sigma-1}}$$

Computing the impact of a shortage of FDPs imports: the model

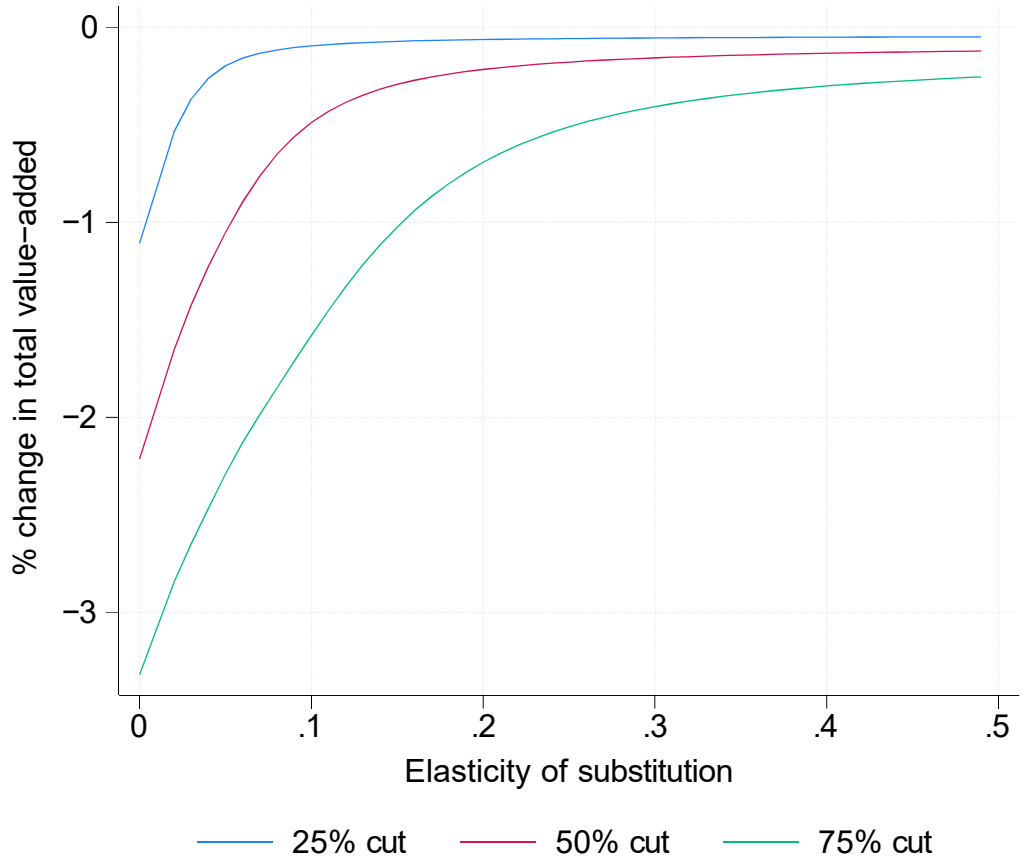
Assuming a firm-specific shock ε_i reduces the availability of foreign-dependent products E, the firm-specific variation of value-added is equal to:

$$\Delta va_i = (1 - \alpha_s - \beta_s)\left(\frac{\left(\gamma_i^{\frac{1}{\sigma}}(1-\varepsilon_i)^{\frac{\sigma-1}{\sigma}} + (1-\gamma_i)^{\frac{1}{\sigma}}\left(\frac{1-\gamma_i}{\gamma_i}\right)^{\frac{\sigma-1}{\sigma}}\right)^{\frac{\sigma}{\sigma-1}}}{\left(\gamma_i^{\frac{1}{\sigma}} + (1-\gamma_i)^{\frac{1}{\sigma}}\left(\frac{1-\gamma_i}{\gamma_i}\right)^{\frac{\sigma-1}{\sigma}}\right)^{\frac{\sigma}{\sigma-1}}} - 1\right)$$

Key parameters:

- sectoral technological parameter (1-α-β) ⇒ intermediate expenditure share
- firm-specific parameter (γ_i) ⇒ firm specific expenditure share on FDPs
- firm-specific shock (ε_i) ⇒ proportional to FDPs imports from “high-risk” countries
- elasticity of substitution (σ) ⇒ we consider different values
- scenarios: import reduction between 25% to 75% (central 50%)

Computing the impact of a shortage of FDPs imports: results

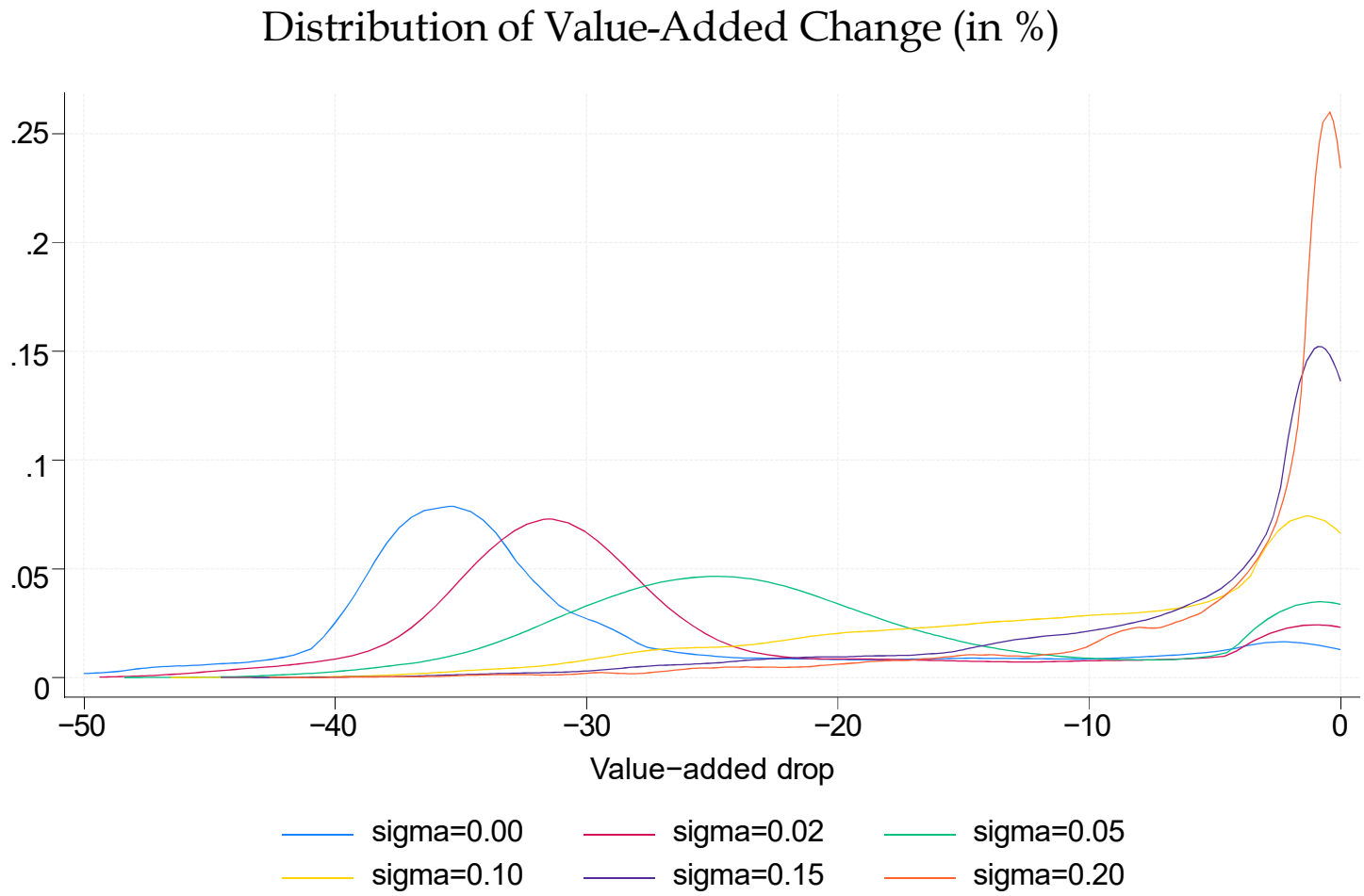


In a severe scenario with low substitutability, 75% FDPs import reduction ⇒ -3% of value added

Halving the supply of FDPs ⇒ -2% of value added

Elasticity of Substitution Matters!

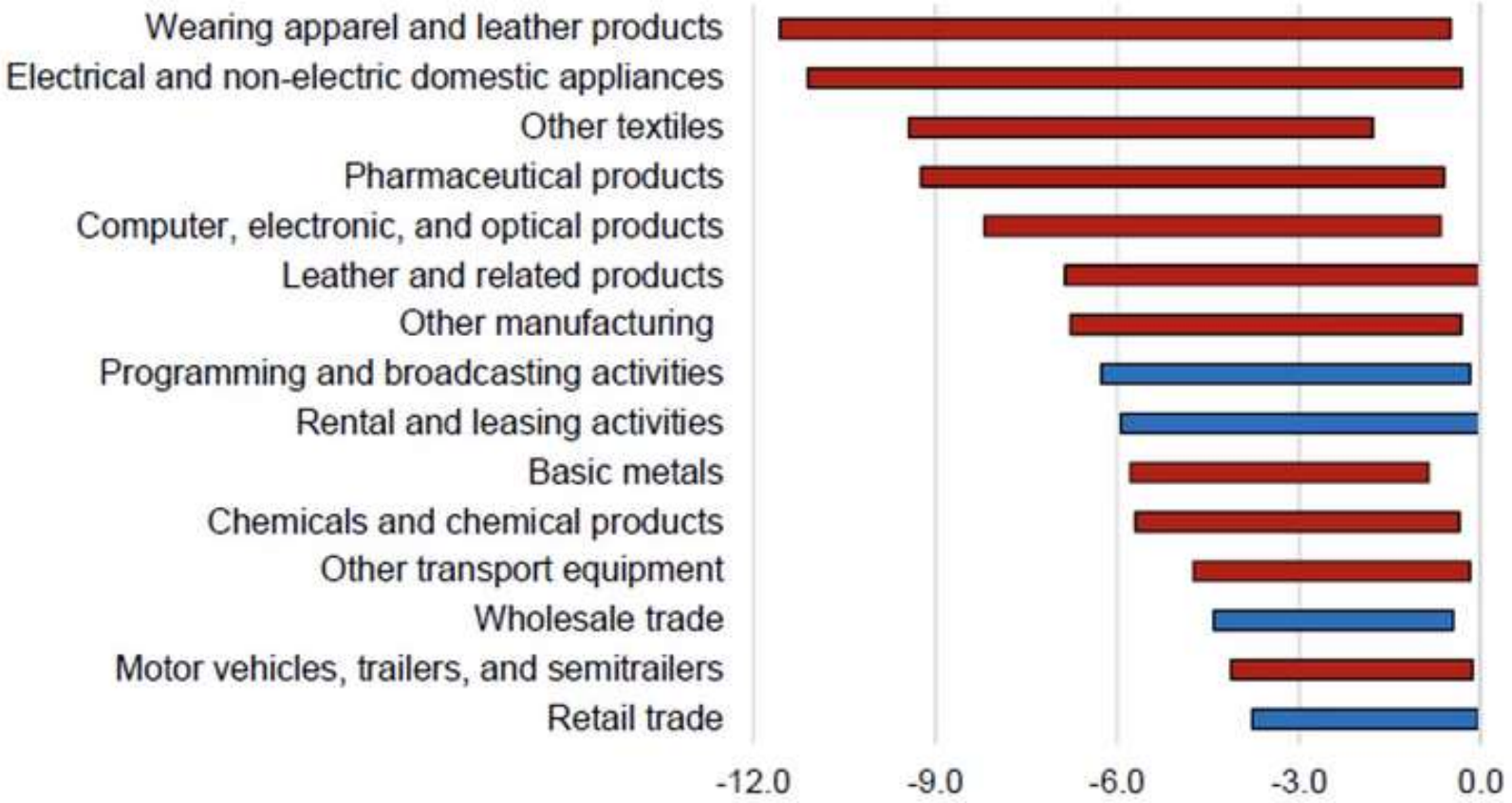
Computing the impact of a shortage of FDPs imports: results



Notes: The figure reports the distribution of value-added changes (in %) due to a 50% cut in FDPs from high-risk countries. We include manufacturing firms only.

Computing the impact of a shortage of FDPs imports: results

Value-added change by sector (%)

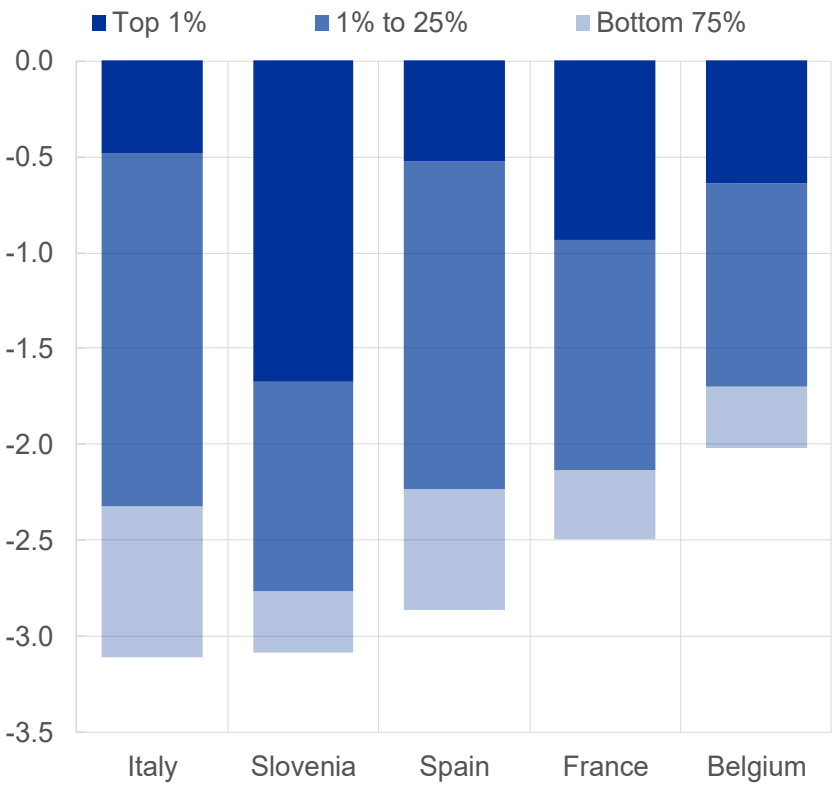


Note: The figure reports the value-added change (in %) across the most exposed sectors from a 50% drop in FDP supply from high-risk countries. Red (blue) bars refer to manufacturing (services) industries. σ ranges from 0 (lower bound of the impact reported in the chart) to 0.5 (upper bound of the impact reported in the chart).

Extending the analysis to other EU countries

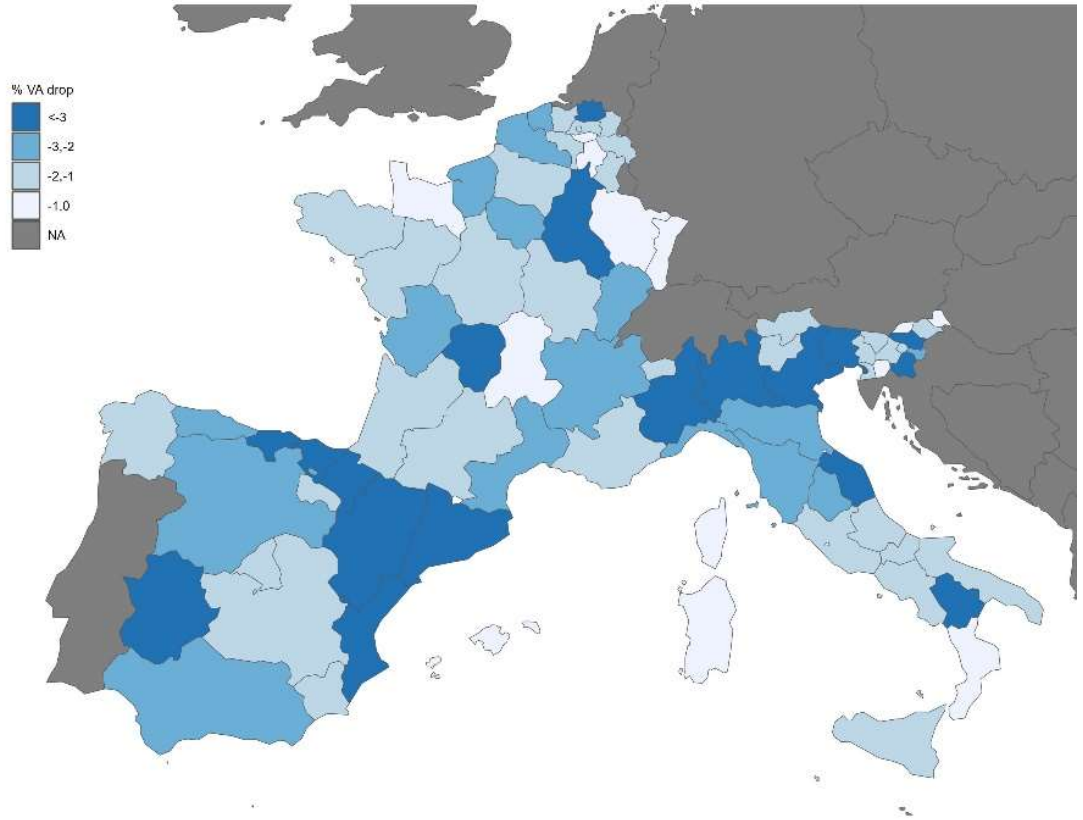
Change in manufacturing value-added across countries

(percentage change)



Change in manufacturing value-added at regional level

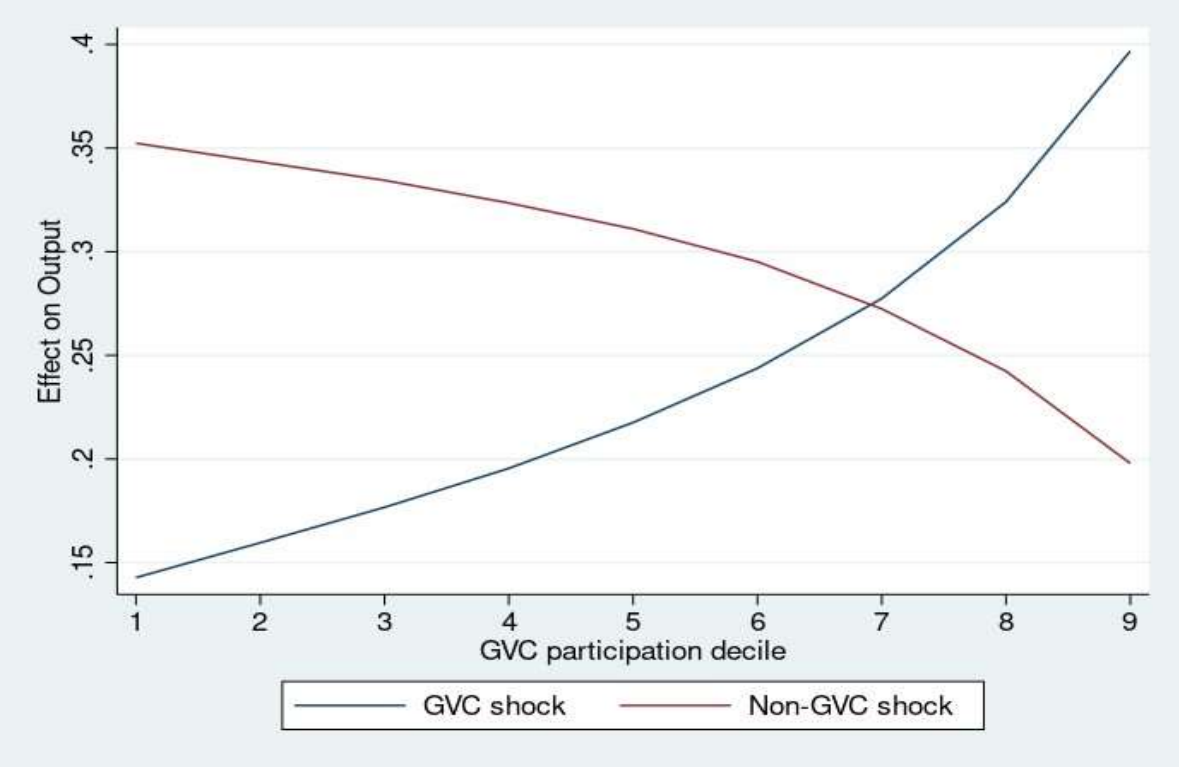
(percentage change)



Sources: Authors' own elaborations based on Panon et al. (2024). Bank of Italy Occasional Papers, Forthcoming

Less integration does not necessary mean less volatility

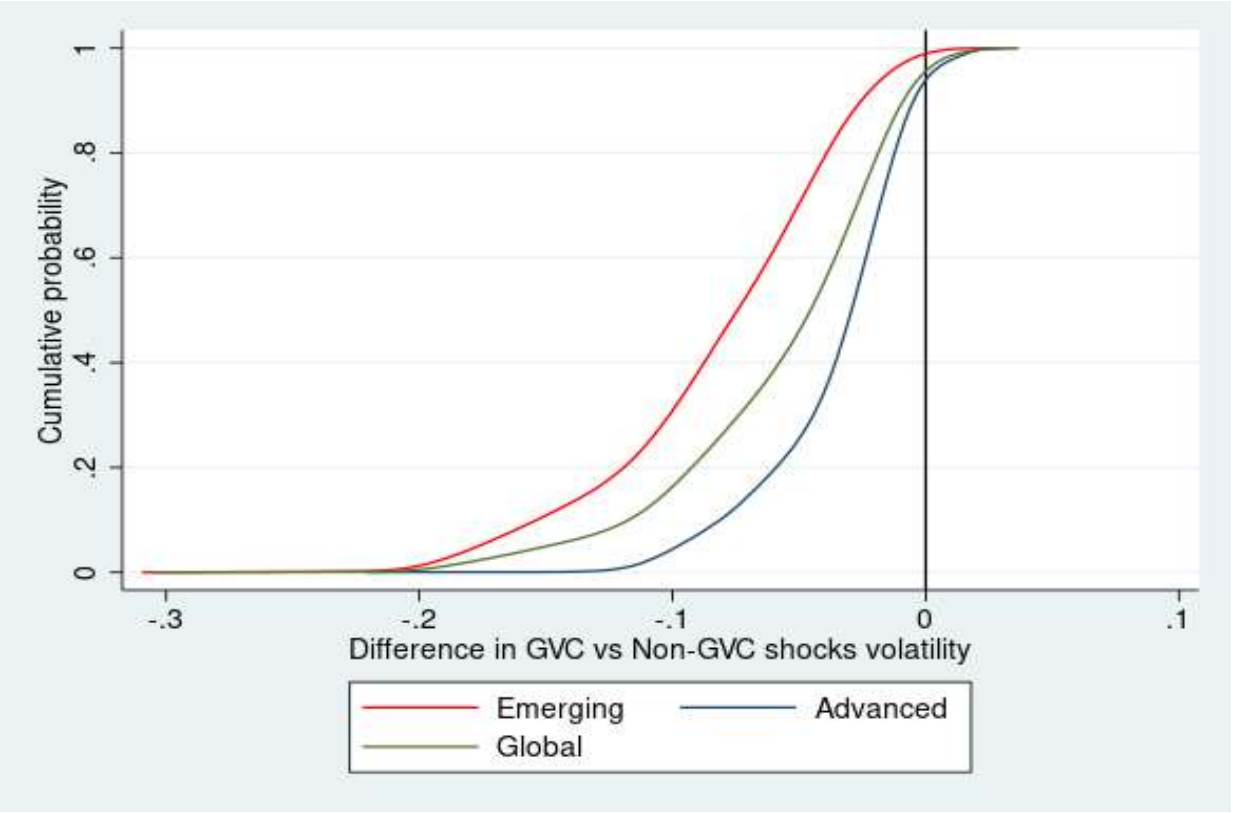
GVC participation dampens the effect of non-GVC shocks (domestic+direct trade), and it increases the one of GVC shocks.



Sources: Borin, Mancini, Taglioni (2021). https://documents1.worldbank.org/curated/en/476361632831927312/pdf/Economic-Consequences-of-Trade-and-Global-Value-Chain-Integration-A-Measurement-Perspective.pdf

Less integration does not necessary mean less volatility

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.



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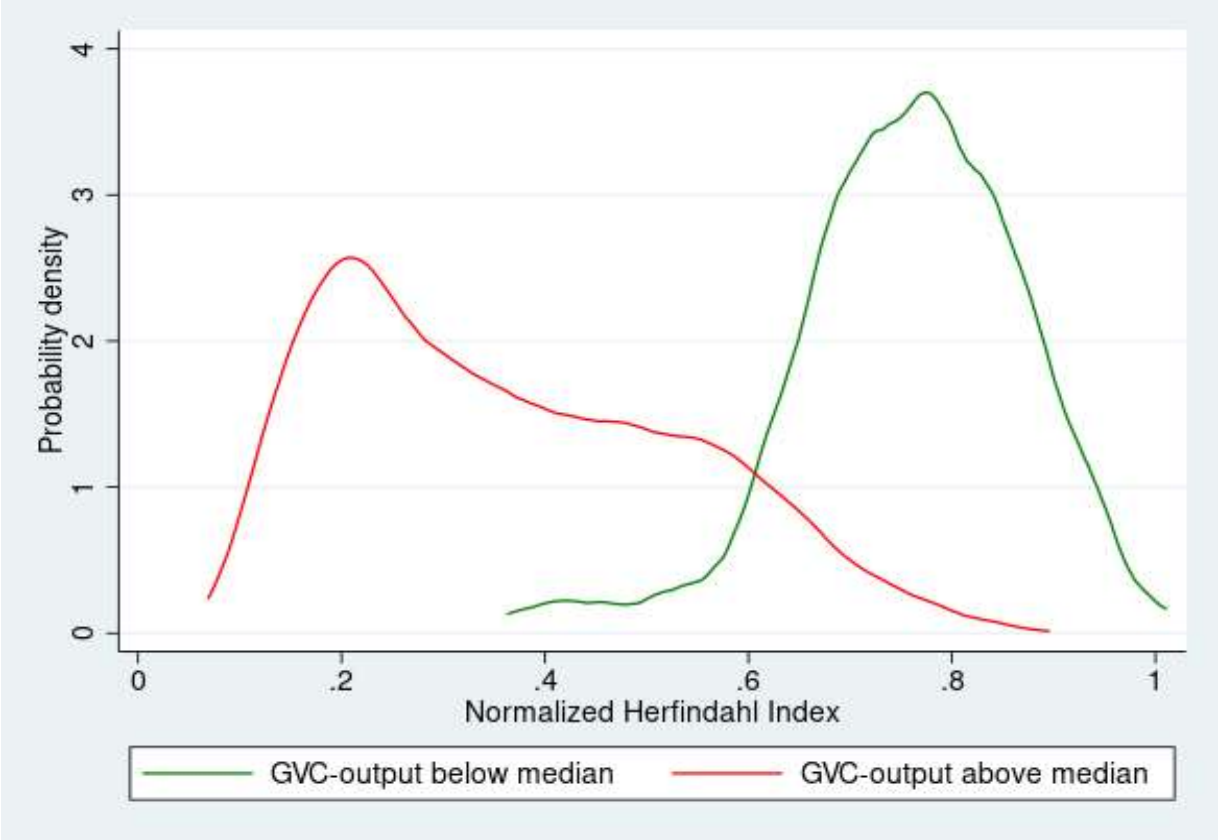
Less integration does not necessary mean less volatility

Lower market concentration of sales for countries-sectors more engaged in GVC



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Wrapping up

- Still **no clear indications of outright deglobalization**
- But increasing signs of **selective decoupling** and international **reorganizations of the productions**
- Fragmentation can be **costly** but **estimates from models vary widely**
- **Pivotal role of China** as a supplier of critical inputs, both at global and EU level
- Effects of supply disruptions vary substantially across countries and sectors

  → *input substitutability/complementary is a key factor*
- Less integration does not necessary mean less volatility

Thank you!

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