

Recent Evolutions in the Global Trade System: From Integration to Strategic Realignment¹

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¹The views expressed in this talk are my own, and do not represent the views of the Federal Reserve Bank of Saint Louis, the Board of Governors of the Federal Reserve, nor any other person associated with the Federal Reserve System.

From Efficiency to Resilience: A Shifting Trade Paradigm

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In this paper: we document how these pressures are reshaping trade patterns, and the challenges this poses for the Euro Area.

Key Trends and Policy Priorities

1. **Rising Competition:** China is shifting from cost-based to innovation-driven competition in strategic sectors.
2. **Selective Fragmentation:** Geopolitical tensions are reshaping trade flows, but the pattern is selective—and China plays a unique role
3. **Concentrated Supply Chains:** Europe relies on a narrow set of countries for key technologies and critical minerals, many of which are geopolitically distant.

These challenges suggest the need for coordinated action:

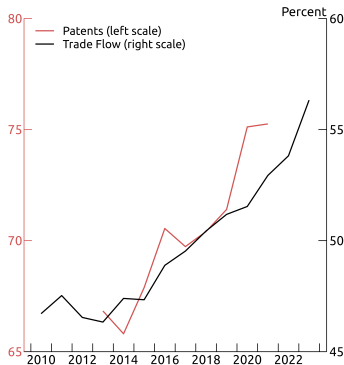
- Deepen internal market integration to improve resilience and foster innovation.
- Balance trade relationships between efficiency and resilience in a fragmented world

China's innovation and export structure is converging with that of Europe

China's Entry into Europe's Core Tech Sectors

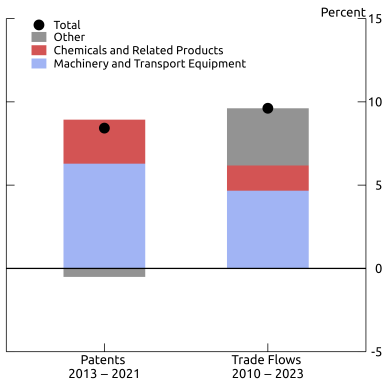
China has ramped up **innovation** and **exports** in tech sectors overlapping with the Euro Area—machinery, transport, and chemicals.

**Export Similarity Index:
Euro Area and China**



Source: Patent data calculations based on LaBelle, J., Martínez-Zarzoso, I., Santacreu, A. M. & Yotov, Y. 2023. "Cross-border Patenting, Globalization, and Development," Working Papers 2023-031, Federal Reserve Bank of St. Louis. Trade flow data calculations based on UN Comtrade.

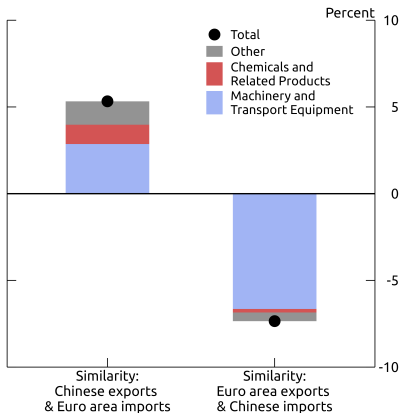
**Change in Sectoral Export Similarity Index
between Euro Area and China**



Note: Other includes ISIC sectors 10-23, 25-28, 36, 37, 40, 41, and 45 for patents, and SITC sectors 0-4, 6, 8, and 9 for trade flows.
Source: Patent data calculations based on LaBelle, J., Martínez-Zarzoso, I., Santacreu, A. M. & Yotov, Y. 2023. "Cross-border Patenting, Globalization, and Development," Working Papers 2023-031, Federal Reserve Bank of St. Louis. Trade flow data calculations based on UN Comtrade.

Asymmetric Realignment in Sectoral Trade Patterns

Change in China-Euro Area Similarity Index,
2010 to 2023



Note: Other includes SITC Sectors 0 through 4, 6, 8, and 9.
Source: UN Comtrade.

Note: Changes in the alignment between China's global export structure and the Euro Area's global import structure (and vice versa) across sectors, 2010–2023. Based on the Partner Similarity Index (PSI). Source: UN Comtrade.

China is aligning with global demand from Europe

- China's global exports increasingly concentrated in sectors that the Euro Area imports from the world

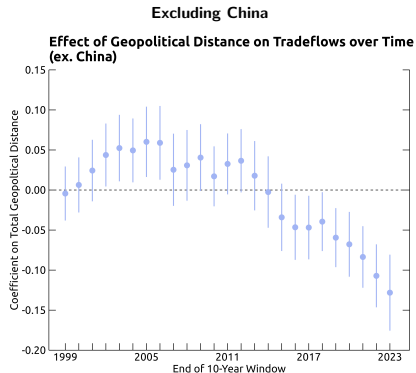
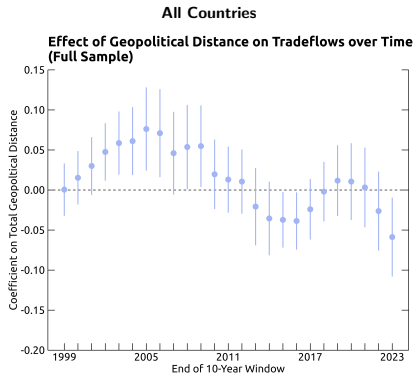
Europe is less aligned with China's global demand

- Euro Area's exports less aligned with China's global imports
- China substituting foreign suppliers with domestic production

Trade realignment is shaped by geopolitical distance—but selectively

Selective Trade Fragmentation

We estimate the response of bilateral trade to geopolitical distance (based on voting divergence in the UN General Assembly) over time



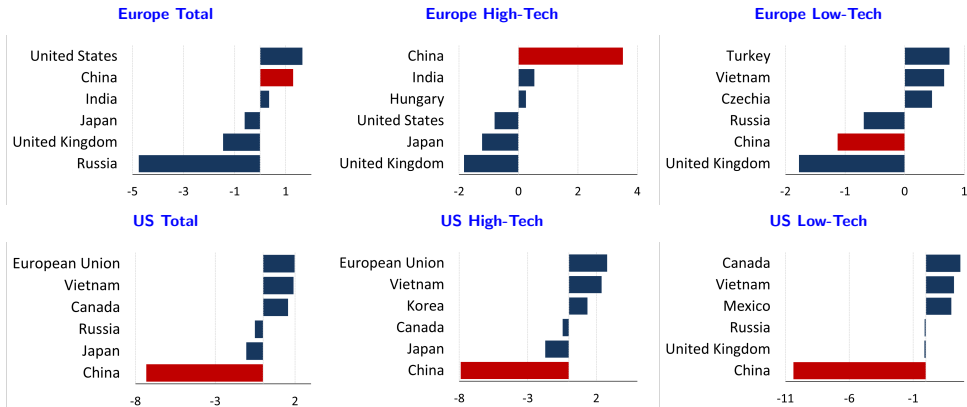
- For most of the period, geopolitical distance had modest impact on trade.
- When China is excluded, the effect is stronger and starts earlier. China maintains broad trade ties—even with geopolitically distant partners.

Note: Coefficient estimates from rolling-window PPML regressions (10-year windows, 1990–2023), with 95% confidence intervals. Geopolitical distance is based on Bailey et al. (2017).

Selective Trade Fragmentation

- Both the United States and Europe reduce imports from Russia
- Europe maintains high-tech trade** with China; **U.S. decouples from China** both across both high- and low-tech sectors

Changes in Import Shares (2017-2023)



Notes: UN Comtrade. Top three bars show largest import shares increases; the bottom three show the largest decreases. Percentage points.

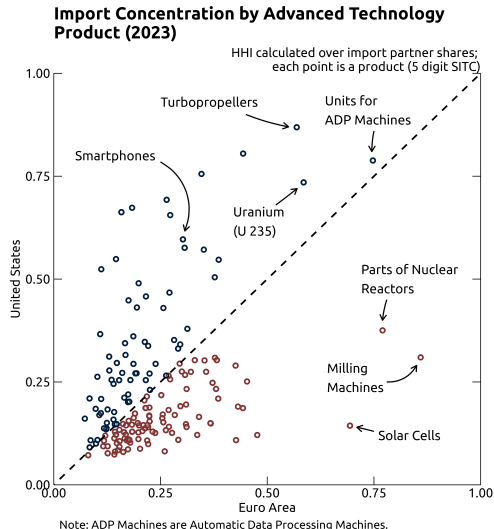
Europe remains reliant on a limited number of geographically distant source countries for key technologies

Strategic Exposure in Advanced Technology Imports

- **High concentration:** Some advanced tech products sourced from few supplier countries
- **Geopolitical exposure:** In both the U.S. and the Euro Area, some of the most concentrated products come from countries with limited political alignment
- **Example:** The U.S. relies heavily on China for computers and smartphones, while Europe is similarly exposed for solar cells and electronic components

Figure: Each point is an advanced tech product (2023).

$$HHI_{i,p,t} = \sum_j \left(\frac{\text{Imports}_{j,p,t}}{\text{Total imports}_{i,p,t}} \right)^2$$
 . An HHI above 0.25 indicates high concentration, meaning a few countries dominate the supply.



Internal barriers persist, limiting Europe's own resilience and integration

The Importance of Deepening the Internal Market

China's rise creates a dual challenge:

- *Substitution risk*: China directly competes in high-tech sectors, displacing European firms through scale and price.
- *Complementarity risk*: China dominates supply of hard-to-replace critical upstream inputs, creating dependencies.

⇒ **These risks reinforce each other**

Europe can respond by reinforcing its internal foundations:

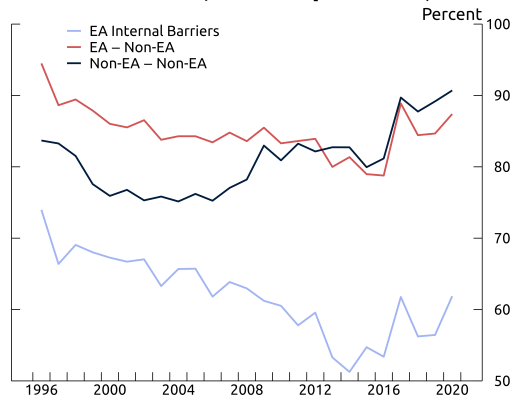
- *A larger, more unified goods market* would boost investment and innovation by enabling firms to scale and gain efficiency
- *Integrated (deeper) capital markets* would help close the financing gap for innovative startups, especially in high-risk sectors.

... **However, integration stalled since the mid-2010s.**

Deepening Internal Market Integration

Despite years of integration, Euro Area internal trade barriers persist.

Trade barriers (Tariff Equivalent)



Notes: Tariff equivalents from PPML gravity estimates. Higher values indicate greater trade barriers. Authors' own estimates.

- **Euro Area internal barriers** remain significant: between **55%** and **70%**
- **External barriers** between EA and non-EA countries are even higher—close to **90%**
- These frictions reflect **regulatory divergence, infrastructure gaps, and non-harmonized standards**

Monetary Policy Implications

- **Inflation Pressures:** Dependence on geopolitically distant countries increases exposure to supply shocks, increasing inflation volatility
 - ▶ Global supply chains optimized for **efficiency** may be vulnerable to geopolitical risk.
 - ▶ Policies that increase **resilience**—via diversification or reshoring—may improve stability, but often raise costs, shifting the inflation-output trade-off faced by central banks
- **Euro Area Heterogeneity:** Divergent external exposures across member states limit risk-sharing and weaken monetary transmission.
 - ▶ Deeper market integration would enhance synchronization and policy effectiveness

Final Remarks: Strategic Shifts in Global Trade

Technology and geopolitics are reshaping Europe's trade landscape.

1. **Technological Convergence:** China now competes directly with Europe in core high-tech sectors
2. **Selective Fragmentation:** Fragmentation is happening, but unevenly across countries & sectors. Despite tensions, China remains central to global trade
3. **Strategic Dependencies:** Europe relies on a few, often geopolitically distant, suppliers for critical inputs, creating vulnerabilities.

⇒ These trends create risks for growth, inflation, and the effectiveness of monetary policy transmission.

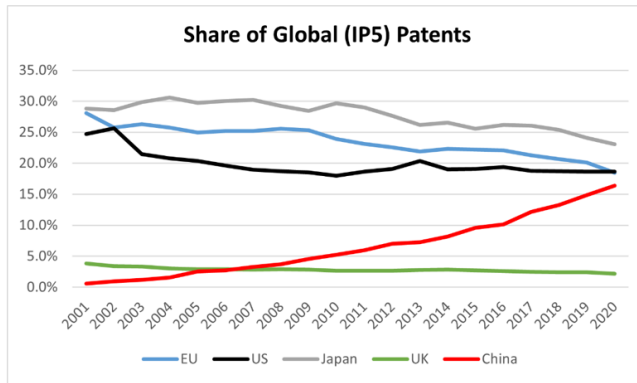
Path forward: Deeper Single Market integration can help Europe leverage its size and wealth to meet these challenges.

Additional Slides

China's Convergence Toward the Global Innovation Frontier

Chart 1

Share of Global IP5 Patents (2001- 2020)



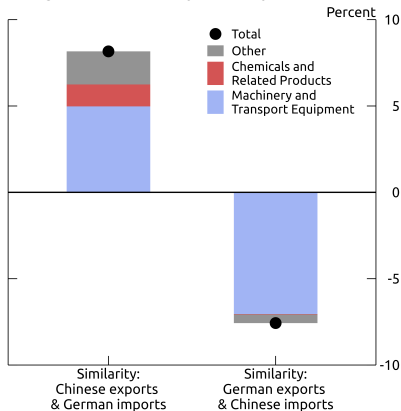
Sources: OECD.

Notes: IP5 patents are patent that are usually considered of high quality, as they have been filed in at least two Intellectual Property offices worldwide, one of which includes Europe, China, Japan, Korea and the U.S.

Stronger Asymmetry for Germany: China Gains, Germany Loses Access

For Germany, the divergence in trade alignment is even sharper: China's exports increasingly match German import needs, while German exports are less aligned with Chinese demand.

Change in China-Germany Similarity Index, 2010 to 2023



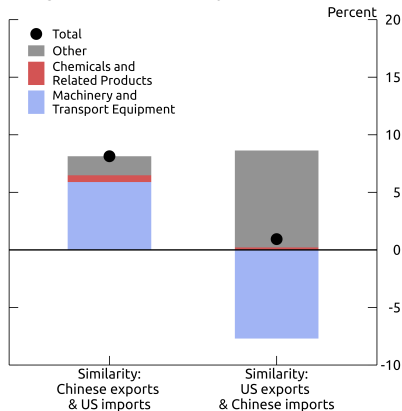
Note: Other includes SITC Sectors 0 through 4, 6, 8, and 9.
Source: UN Comtrade.

Notes: The [Partner Similarity Index \(PSI\)](#) measures how closely China's exports match Germany's sectoral imports and vice versa. Source: UN Comtrade.

U.S.–China Trade Alignment Remains Stable

China's exports are less concentrated in sectors that match U.S. import needs, and U.S. export alignment with Chinese demand remains relatively stable.

Change in China-US Similarity Index, 2010 to 2023

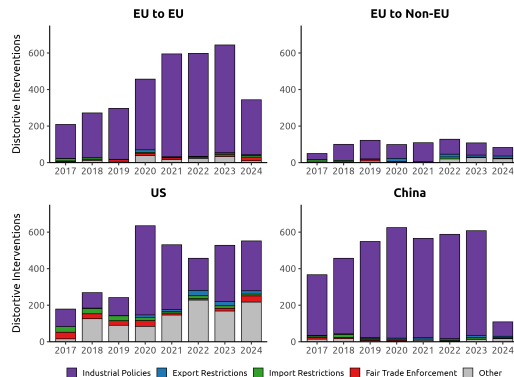


Note: Other includes SITC Sectors 0 through 4, 6, 8, and 9.
Source: UN Comtrade.

Notes: The [Partner Similarity Index \(PSI\)](#) measures how closely China's exports match US sectoral imports and vice versa. Source: UN Comtrade.

Recent National Policies and Their Implications for Internal Market Integration

Since 2020, EU industrial policy has ramped up—but in contrast to the U.S. or China, Europe's response has so far relied heavily on national-level actions



"Industrial policies" includes all interventions classified as subsidies and export incentives. "Fair trade enforcement" includes interventions classified as trade defence (e.g. anti-dumping measures), while "other" includes interventions classified as FDI, localization, and other in GTA classification.

Remaining Trade Barriers in Strategic High-Tech Sectors

Tariff-equivalent barriers remain high in key technology industries—highlighting untapped gains from regulatory harmonization and market integration.

Tariff Equivalents in Selected High-Tech Industries (Euro Area, 2020)

Industry	Tariff Equivalent (%)
Chemicals	58.8
Machines	63.9
Metals	94.1
Vehicles	86.4

Notes: Tariff equivalents computed from PPML gravity estimates using elasticity of substitution $\sigma = 5$.

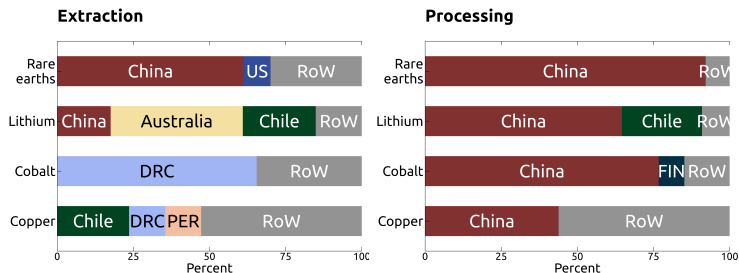
Two Strategic Challenges: Competition and Input Concentration

1. Rising Competition in Strategic Sectors

China increasingly challenges domestic producers, displacing output and reducing market share.

2. Dominance in Hard-to-Replace Inputs

China dominates critical inputs like rare earths. Export restrictions could disrupt production.

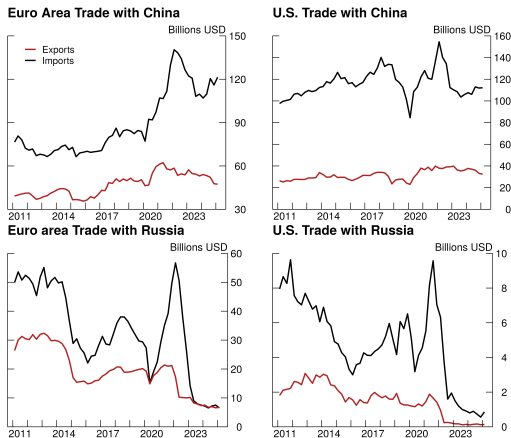


Note: Individual country shares shown when larger than 10 percent. RoW is rest of the world. DRC is Democratic Republic of the Congo, FIN is Finland, and PER is Peru.

Source: International Energy Agency.

Trade Fragmentation Varies Across Partners

1. Exports to China decline in both Europe & US, while EU imports from China continue to rise
2. Both Europe and the U.S. reduced trade with Russia

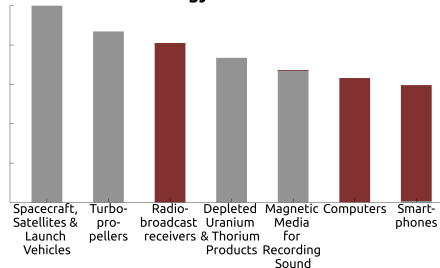


Notes: Euro Area and U.S. bilateral trade with China and Russia. Quarterly trade in billions USD.

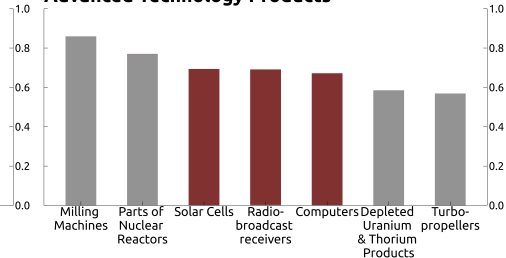
Geopolitical Distance and Import Concentration in Key Sectors

Advanced technology imports are highly concentrated, often sourced from geopolitically distant countries.

US Import Concentration, Advanced Technology Products



Euro Area Import Concentration, Advanced Technology Products



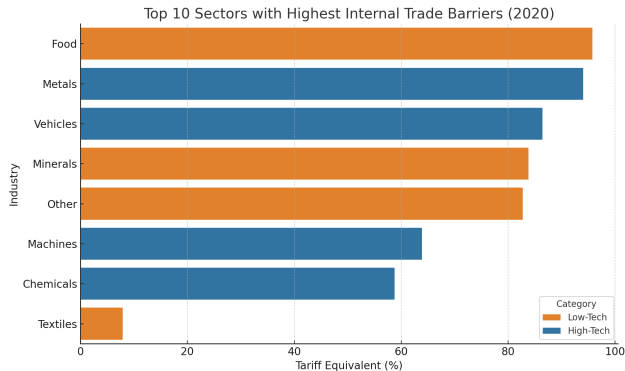
■ Geopolitically Distant Countries ■ RoW

Notes: Top concentrated advanced technology sectors (2023). Dark red represents geopolitically distant sources; gray represents rest-of-world.

Deepening Internal Market Integration

Internal trade barriers in the Euro Area remain high—especially in strategic sectors. These frictions signal untapped gains from regulatory harmonization and deeper market integration.

Top 10 Industries by Internal Trade Barriers (2020)



Notes: Tariff equivalents from PPML gravity estimates using elasticity of substitution $\sigma = 5$. High-tech sectors in blue; low-tech sectors in orange.