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Ports of Power



EUROPEAN CENTRAL BANK

EUROSYSTEM

Chinese Investments in Ports and the European Trade Network

- Maritime trade is the backbone of global commerce
- Ports are **trade gateways**
- Global: **90%** of goods value moves by sea
- Europe: **~3/4** of extra-EU trade enters via seaports
- This **dependence** is concentrated in a few critical **deep-water ports**
- Ownership of these critical ports has shifted, with **Chinese state-owned** enterprises holding significant stakes

EU exposure to China: two distinct waves



€213

Exports to China



€518

Imports from China

- China Shock 1.0:** Trade integration
- China Shock 2.0:** Trade + **geopolitics**
(critical inputs, key technologies, other dependencies + *infrastructure*)

China docks in Europe



- 24** port deals from Antwerp to Piraeus
- Port acquisitions exceed **€9.1bn** (2004-2021)
- 0.7%** of total EU-inward FDI
- Handle **~10%** of EU port terminal capacity
- Maritime Silk Road**, seaborne leg of the Belt and Road Initiative (BRI)
- EU is a partner + a terminal node

BRI



Research Question

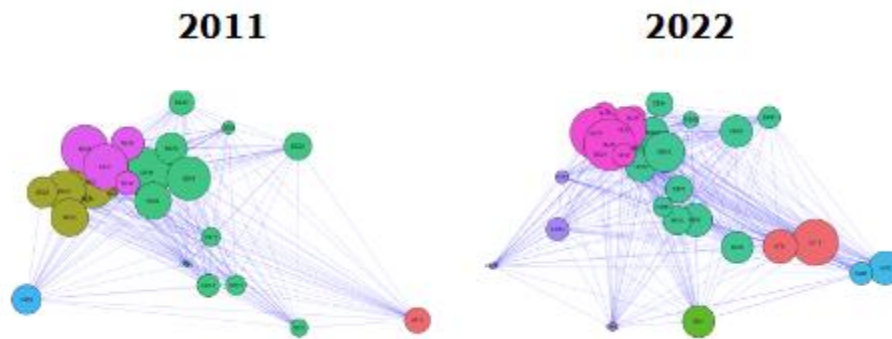
How do **Chinese investments in ports** change the **European port network**?

- Do the most exposed regions experience trade **expansion** or **contraction**?
- How does the **composition** and **direction of trade links** change?
- Do **trade corridors** shift, and if yes, how?

I leverage **two sources of variation**:

- The staggered roll-out of COSCO's port investments
- Region-industry cell variation in pre-treatment exposure to these ports

Why study the trade network?



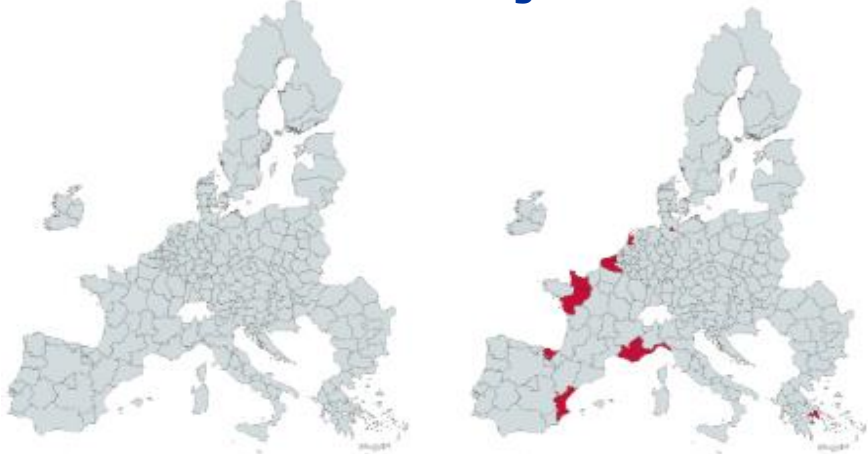
- The trade network within the Single Market is often assumed to be stable.
- In practice:** the intra-EU subnational network has changed substantially.

Novel Dataset

- Hand-collected data on port acquisitions
- 1.5** million truck-level shipments × **368** NUTS2 regions × **48** quarters (2011–2022) × **20** industries

Identification

Ports to Regions



Defining the Shock: COSCO acquires port p .

$(U, \quad U < I_p,$

Scaling by Investment Intensity

$$\begin{aligned}\tilde{D}_{p,t}^{\text{TEU}} &= D_{p,t} \times \text{TEU_capacity}_p, \\ \tilde{D}_{p,t}^{\text{equity}} &= D_{p,t} \times (\% \text{ equity}_p).\end{aligned}$$

Institutional Timing & Exogeneity

- Selection is **strategic**
- ...but timing is **institution-driven** and **plausibly exogenous**
- I leverage **staggered shocks** × **differential pre-reliance** for identification

Baseline Port-Region Reliance Metric

$$\text{port_rel}_{p,ij} = \frac{w_{ij \rightarrow p}}{\sum_{d \in \mathcal{D}} w_{ij \rightarrow d}}.$$

Constructing the Exposure Dose

$$\exp_{p,ij,t} = D_{p,t} \times \text{port_rel}_{p,ij} \quad \text{and} \quad \text{exposure}_{ij,t} = \sum_{p \in \mathcal{P}} \exp_{p,ij,t}$$

- Stepwise "dose":** each port's shock flips on only at its acquisition.
- Weighted impact:** regions more reliant on an early-acquired port receive a larger "injection" of exposure sooner.
- Continuous intensity:** exposure accumulates across acquired ports.

Event Study with Continuous Treatment

$$y_{ijt} = \sum_{k=-K_0}^{K_1} \beta_k [\text{exposure}_{ij,t}]_{t-T_{\max}=k} + \alpha_{ij} + \gamma_t + \varepsilon_{ijt},$$

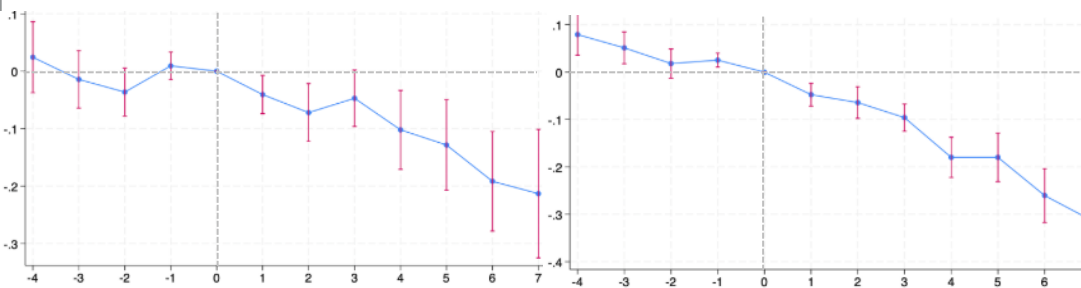
where

$$[\text{exposure}_{ij,t}]_{t-T_{\max}=k} = \sum_p D_{p,t} \text{port_rel}_{p,ij} \quad \text{evaluated at } t-T_{\max}=k.$$

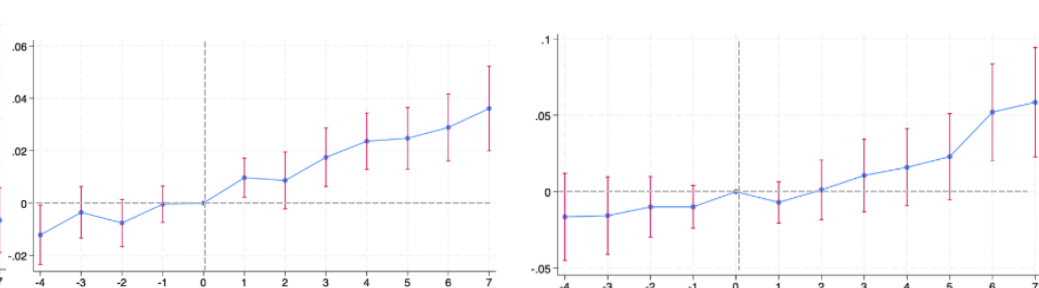
- Origin-industry and time fixed effects included
- β captures the dynamic effect of exposure at event time k
- Dynamic DiD estimator** → no TWFE bias
- Estimator: de Chaisemartin & d'Haultfoeuille (2024)

Results

1/ Intensive Margin of Trade (Flows)



2/ Extensive Margin of Trade (HHI indices)



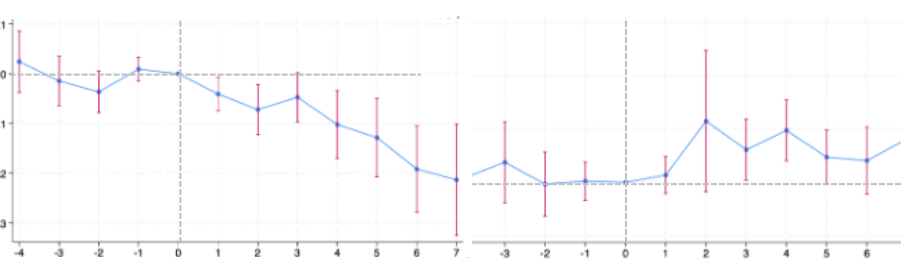
3/ Trans-European Transport Network (TEN-T) & Trade Corridors

#	Corridor	BRI-aligned
1	Baltic–Adriatic Corridor	✓
2	North Sea–Baltic Corridor	✗
3	Mediterranean Corridor	✓
4	Orient/East-Med Corridor	✓
5	Scandinavian–Mediterranean Corridor	✗
6	Rhine–Alpine Corridor	✗
7	Atlantic Corridor	✗
8	North Sea–Mediterranean Corridor	✗



Western-EU corridors

BRI-aligned corridors



- Trade **volumes: relative declines** in more exposed regions
- Trade links: **relatively more concentrated** (higher HHI)
- Evidence of corridor reallocation toward BRI-linked routes
- Network centrality changes

Mechanism: Network Reallocation

Extra: Granular Freight Data Reveals Hidden Trade Patterns

Benchmark: Ownership shouldn't matter.
Here: Coordination at key nodes **reweights flows**.

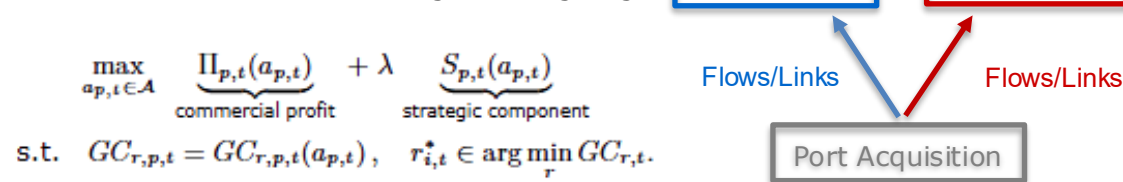
1a) Trade/network theory:

- Small nodal cost or reliability changes propagate
- Vertical integration shifts routing incentives
- Inland trade reallocates across corridors (Allen & Arkolakis, 2014;2021)

$$GC_{r,p,t} = \text{Price}_{p,t} + \theta_1 \text{Time}_{p,t} + \theta_2 \text{Reliability}_{p,t} + \theta_3 \text{Coordination}_{p,t}$$

1b) Geoeconomics perspective:

- Control over nodes reshapes interdependence (Clayton et. al, 2025; Trebesch & Mohr, 2024)
- ...even without tariffs or formal trade policy
- Infrastructure embeds strategic routing, e.g.:



Granular freight data captures:

- Transshipment dynamics:** rerouting, hub shifts, network reconfigurations
- Fraud-related signatures:** reporting patterns and logistical schemes associated with customs-fraud investigations (e.g. Calypso in Piraeus)

