Tariffs and Danish Exports

Insights from Three Decades of Microdata

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Research Brownbag, May 2026

The views expressed are those of the authors and do not necessarily reflect the views of Danmarks Nationalbank or Sveriges Riksbank.

Motivation

Trade liberalization was the dominant paradigm for the last three decades

- Regional trade agreements expanded, and tariffs fell on average

More recently: trade policy has shifted back toward protectionism

- Recent US tariff increases illustrate renewed exposure to foreign trade-policy shocks

Research question

- How do exporters in a small open economy respond to foreign tariff changes?

Paper in a nutshell

How do exporters in a small open economy respond to foreign tariff changes?

Denmark provides a useful setting to study plausibly exogenous foreign tariff shocks

- For most foreign countries, Denmark is typically a minor trade partner
- Denmark faces mostly non-discriminatory tariff changes
- Most Danish firms export the same product to multiple destinations

Using local projections, we show that

- A 1 percent rise in gross foreign tariffs lowers export revenues by 0.5 percent after four years
- Quantities (weight in tonnes) and f.o.b. unit values fall, suggesting partial tariff absorption
- Firms show little adjustment in employment or investment, with suggestive evidence that they serve more destinations

Contribution to the literature

Measuring the trade elasticity Boehm, Levchenko, and Pandalai-Nayar (2023) and Teti (2024)

- We provide long-run, firm-level evidence from a small open economy

Exporter adjustments to foreign trade-policy shocks Berman, Martin, and Mayer (2012), Fitzgerald and Haller (2018), Flaaen and Pierce (2024), and Jiang et al. (2023)

- We decompose the revenue response into quantity and unit-value components

Real firm outcomes after export-market shocks

- We link customs data to firm-level employment, investment, and destination entry

2. Data & Identification

Foreign tariff changes are plausibly exogenous to individual Danish exporters

Data

Three highly granular datasets for 1993 to 2021

1. Global Tariff Database (Teti, 2024) for Danish exports
   - Destination $\times$ good $\times$ year
   - Corrects interpolation issues with commonly used WITS tariff data
2. Danish customs records (UHDM, Statistics Denmark) on goods trade
   - Firm $\times$ destination $\times$ good $\times$ month
   - Export revenues, quantities, and f.o.b. unit values
3. Danish firms' balance sheets (FIRE/FIRM)
   - Firm $\times$ year
   - Labor productivity, employment and investment, used later

Identification

Denmark is a small open economy facing plausibly exogenous tariff changes

1. For most foreign countries, Denmark is typically a minor trade partner
   - On foreign markets (destination $\times$ product $\times$ year), Denmark's median market share is 0.28 percent (average 5 percent) Details
2. Denmark faces mostly non-discriminatory tariff changes
   - 65 percent of tariff changes are non-discriminatory; preferential changes often target broader blocs rather than Denmark specifically Details

How do firm-level data identify the effects?

- Firms exporting a product on multiple foreign markets account for 95 percent of total goods exports Details

Estimation framework

How does a firm's export growth for a product change across destinations with different tariff trajectories?

We use local projections (Jorda, 2005) for firm f $\times$ destination d $\times$ product p $\times$ year t

- $X_{f,d,p,t}$ is the outcome: export revenues, quantities, or unit values
- $\tau_{d,p,t}$ is the gross tariff ($1 +$ tariff rate) imposed by destination d on product p
- $\Delta_h y_t \equiv y_{t+h} - y_{t-1}$ is the cumulative change from $t-1$ to $t+h$

$$\Delta_h \ln X_{f,d,p,t} = \beta_h \, \Delta_h \ln \tau_{d,p,t} + \delta_{f,p,t} + \delta_{d,t} + \delta_{d,p} + u_{f,d,p,t}.$$

β_h traces the response of exports h years after a tariff change (trade elasticity)

- Identification from within-firm variation in tariff changes and export growth across destination-product markets

3. Results

Tariffs and Danish firms' outcomes

Export revenues

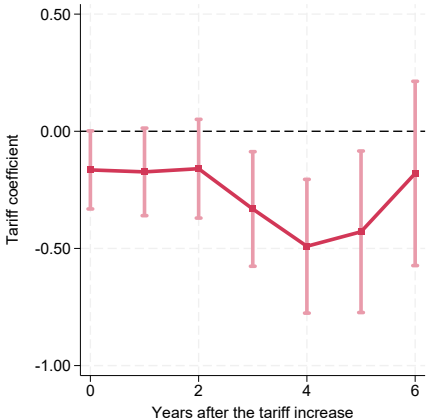
Revenue losses peak after four years

On impact, a 1 percent increase in gross tariffs reduces exports by 0.16 percent

After four years, a cumulative 1 percent increase in gross tariffs reduces exports by 0.5 percent

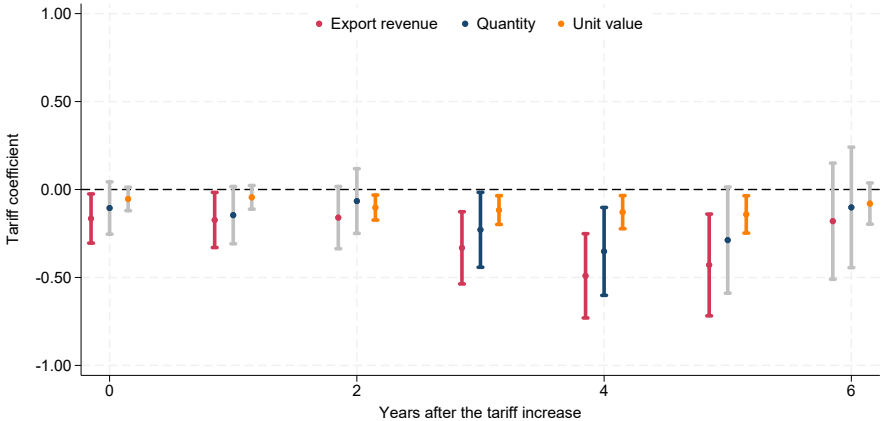
Log differences condition on continuing exporters

- Accounting for firm-exit gives stronger responses Results



Decomposition into price and quantity effects

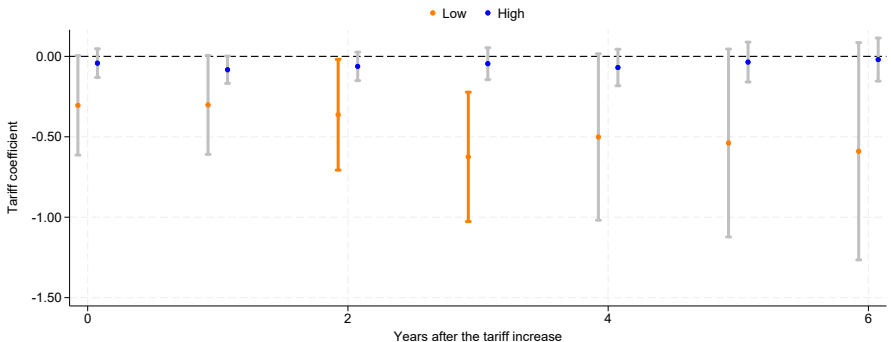
Quantities and unit values fall, suggesting that Danish firms absorb at least part of the tariff burden



Heterogeneity

In particular, firms with lower labor productivity decrease their unit values

Sample split for firms with above and below median labor productivity

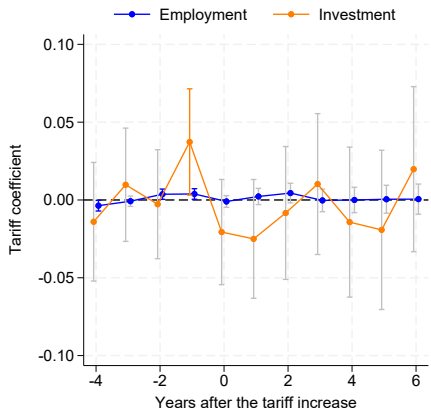


Firm-level outcomes

Employment and investment without a clear response

Linking export data and balance-sheet data, we use local projections at the firm-year level

- Outcomes are employment and investment
- Point estimates close to zero and mostly insignificant.
- Capital decisions may be more reversible than labor

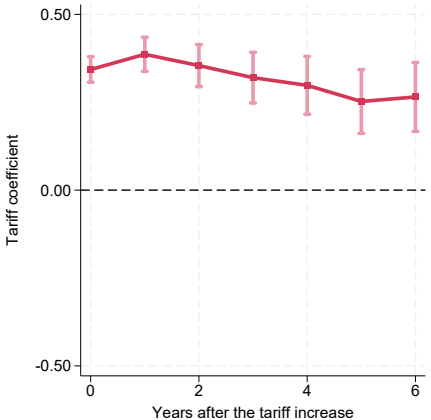


Firm-level outcomes

Suggestive evidence that firms serve more foreign countries

Do firms respond to tariff increases by expanding the set of destinations they serve?

- Outcome is the number of countries to which a firm exports each year
- Persistent increase of around 0.3 destinations
- Average: 10 countries per firm/year
- Suggestive of:
  - → **Reorientation** to lower-tariff markets.
  - → **Rerouting** via intermediaries.



Conclusion

1. Danish export revenues fall by 0.5 percent per 1 percent increase in gross tariffs — in line with international evidence.
2. Adjustment is through lower quantities, but also lower unit values.
3. No significant impact on **employment** or **investment**.
4. Firms **expand export destinations** — diversification as the key adjustment margin.

Policy takeaway

Historical resilience may not extrapolate to large, simultaneous, or more uncertain tariff shocks.

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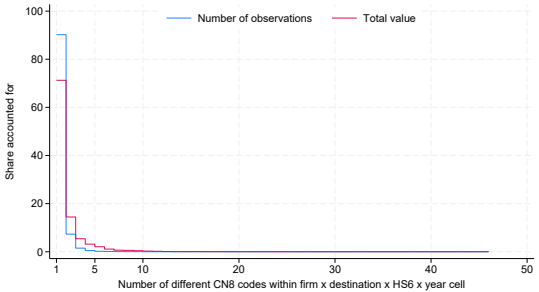
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Appendix

Constructing unit values

Do firms report many different CN8 goods for a given HS six-digit code?

For each firm $\times$ destination $\times$ HS6 $\times$ year cell, how many different CN8 codes are there?

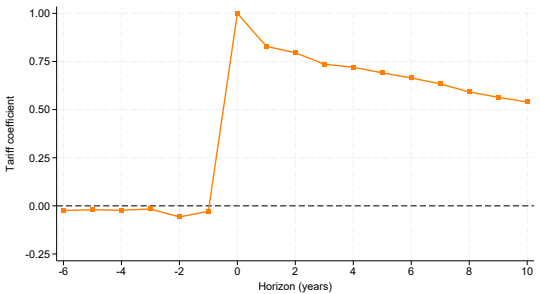


In 90 percent of cells (accounting for 70 percent of total exports), there is a single CN8 code. This leaves limited room for aggregation bias. For the remaining cells, the number of different CN8 codes is relatively small, and they account for little export value

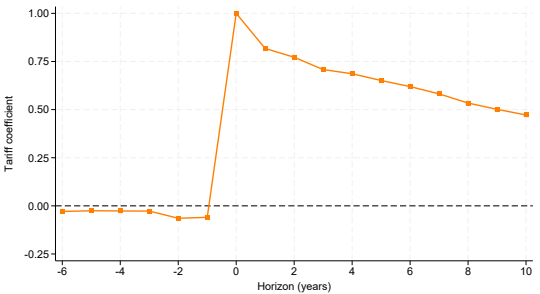
Tariff-Tariff local projections

Tariff changes are typically not one-off and not permanent

(a) Without controls



(b) With controls



Appendix: Closest papers to ours

- Fitzgerald and Haller (2018, JIE) — use Irish firm–product–destination customs data to study export responses to tariff and demand shocks.
  → Closest small-open-economy analogue; we extend with unit values, quantities, and real margins.
- Jiang et al. (2023, JIE) — Chinese firm-level evidence on the US–China trade war, documenting margin-specific responses.
  → Firm-level tariff-shock template; we provide a peacetime, multi-decade counterpart.
- Boehm, Levchenko, and Pandalai-Nayar (2023, AER) — short- vs long-run trade responses identified from WTO MFN tariff variation.
  → Aggregate benchmark; we reproduce comparable magnitudes at the firm level.
- Teti (2024) — corrected WITS tariff dataset; revises prior aggregate estimates.
  → Tariff-data foundation we build on.
- Berman, Martin, and Mayer (2012, QJE) — French exporters absorb exchange rate shocks through markups rather than export quantities, especially high-productivity firms.
  → Direct parallel to our pass-through and unit-value evidence for Danish exporters.
- Flaaen and Pierce (2024, RES) — firm-level real effects of 2018–19 US tariffs on US manufacturing employment and output.
  → Closest firm-level evidence on real outcomes; complements our employment/investment results.

Summary statistics

	Exporters	Non-exporters
No. of firms	31,841	382,136
Revenue (mill. DKK)	18.55	2.15
Employment	11.14	2.02
Firm age (years)	29	25
Destinations per firm/yr	10	–
HS6 products per firm/yr	6	–

For most foreign countries, Denmark is typically a minor trade partner

Return

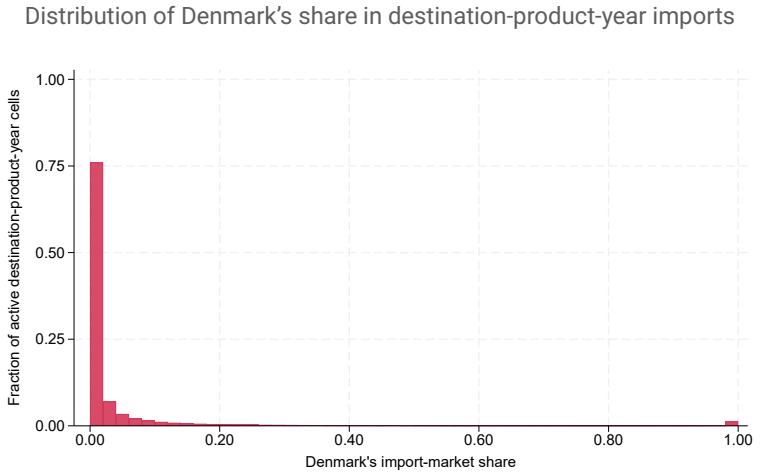
Table: Denmark's Share in Foreign Import Markets

Sample (destination-product-year cells)	Observations	Mean	Median	P75	P90	P95	P99
All foreign cells	23,229,650	0.98	0.00	0.00	0.26	1.73	26.79
Cells with positive Danish exports	4,535,236	5.04	0.28	1.83	10.06	27.68	99.99

Notes: The table reports Denmark's share in foreign destination-product-year import markets using BACI data. A cell is defined at the importer-product-year level. Denmark's import-market share is imports from Denmark divided by total imports of the destination-product-year cell. All shares are reported in percent. The second row conditions on strictly positive imports from Denmark.

For most foreign countries, Denmark is typically a minor trade partner

Return



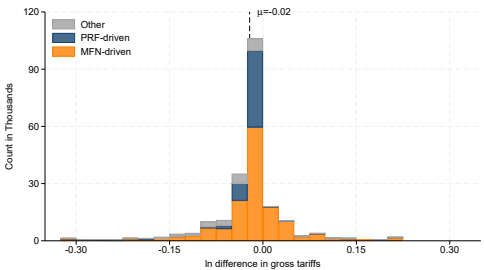
Denmark faces mostly non-discriminatory tariff changes

Return

Most-favored-nation (MFN) tariffs at the WTO

- A country must apply its MFN tariff to all WTO members
- The main exception for lower tariffs is preferential trade agreements
- Because Denmark is usually a minor trade partner, MFN changes are plausibly exogenous

Distribution of non-zero tariff changes.



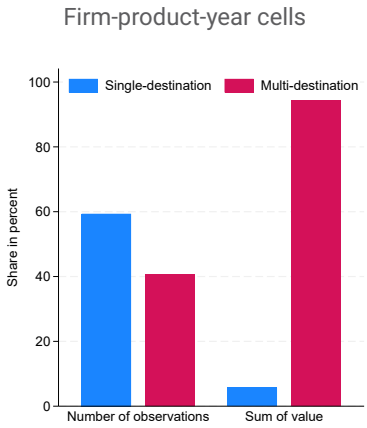
Most Danish firms export the same product to multiple destinations

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We use variation across destinations within a firm-product-year cell

Such multi-destination cells account for most of Danish exports

- 40 percent of all cells
- 95 percent of total value



Accounting for firm entry and exit

Return

IHS-transformed exports

With (long) log-differences, 0s drop out of the estimation sample

- Results are therefore conditional on continuing exporters (intensive margin)

With IHS-differences ($\ln\left(x+\sqrt{x^2+1}\right)$), 0s remain in the estimation sample

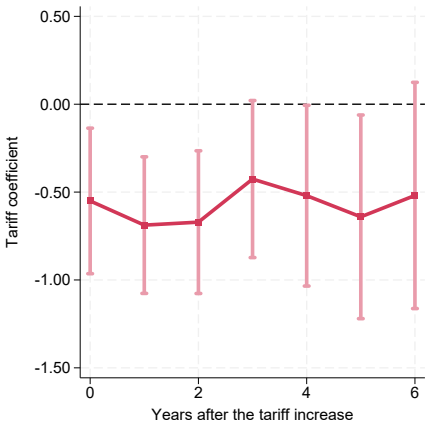
- Results also capture the extensive margin (but coefficients are not elasticities)

Accounting for firm entry and exit

Return

Larger and more persistent decreases

IHS-transformed exports (includes zeros).



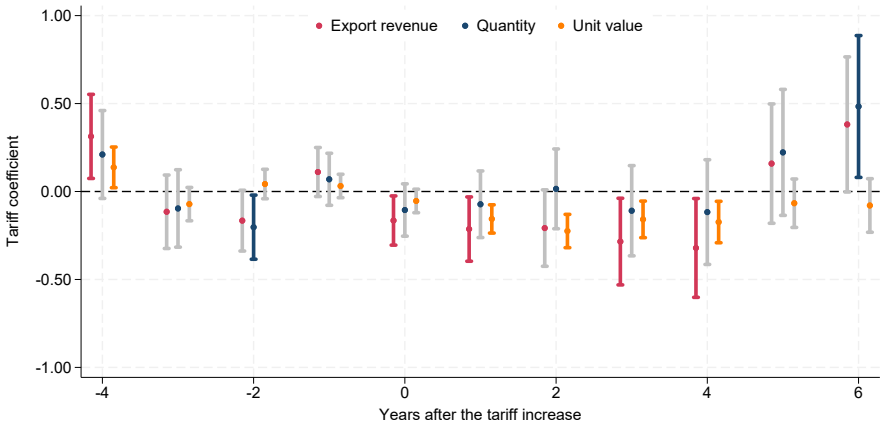
Extensive margin included

- Estimates settle around -0.5
- Large effects relative to intensive margin only

Alternative specification

Return

Initial rather than cumulative tariff change



Caveats

- Identification uses **modest historical** tariff variation.
  - → Max hike $\approx$ 13 percent; average $\approx$ 3 percent.
  - → Elasticity may be non-linear in larger shocks (e.g. 2025 US $+15$ pp).
- Weight-based **quantity proxy** introduces measurement error — especially for high-value, low-weight goods.
- Customs data cover only **goods trade** ($\sim$ 73 percent of Danish exports in 2024) — services excluded.
- Past tariff changes were **isolated and bilateral**. A coordinated, multi-country escalation could yield very different effects.