Oil Shipping and Pirates

The Macroeconomic Effects of Oil Tanker Attacks

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Paper
(earlier version)

In a nutshell

Research question: What are the macroeconomic effects of attacks on oil tankers?

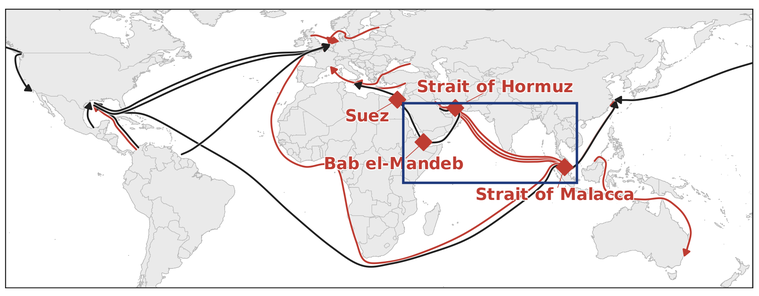
Methodology

1. We build a record of 72 exogenous oil tanker attacks (1999–2025) and use the **Baltic Dirty Tanker Index (BDTI)** to measure high-frequency movements in crude-oil shipping costs around them.
2. We use these surprises as an instrument for an oil-shipping-cost shock in a monthly proxy SVAR for the United States (August 1998–February 2026).

Results

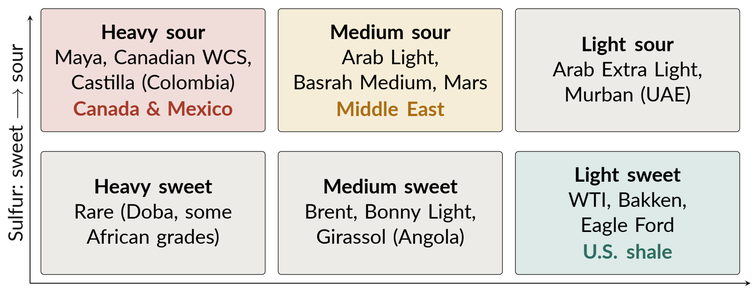
- Tanker attacks lower industrial activity and move inventories, but do not increase oil prices.
- Channels: **energy trade** and **increased uncertainty**.
- The effects of attacks depend on the **surrounding environment**.

Most oil travels by sea and crude oil is not homogeneous



Oil shipping routes

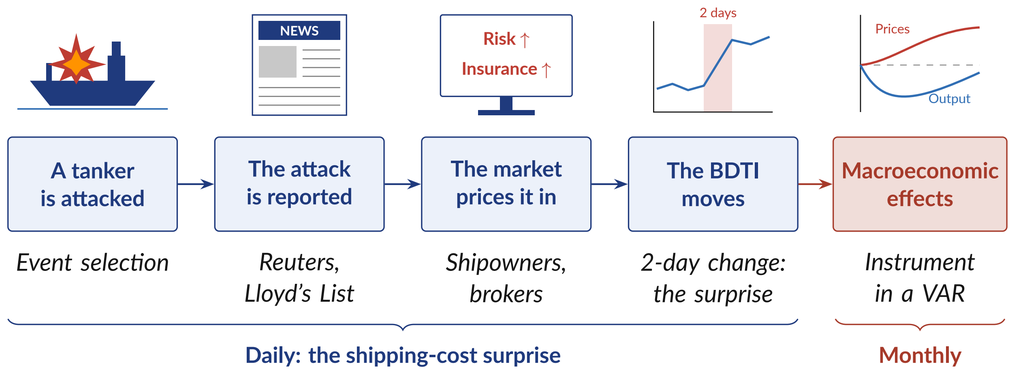
- **Two thirds** of oil travels by sea, via chokepoints (♦).
- **Red:** 11 **BDTI** routes for daily oil-tanker freight rates.
- **Tankers: prime targets** that operate on a **global market** (Hacaga, 2020).

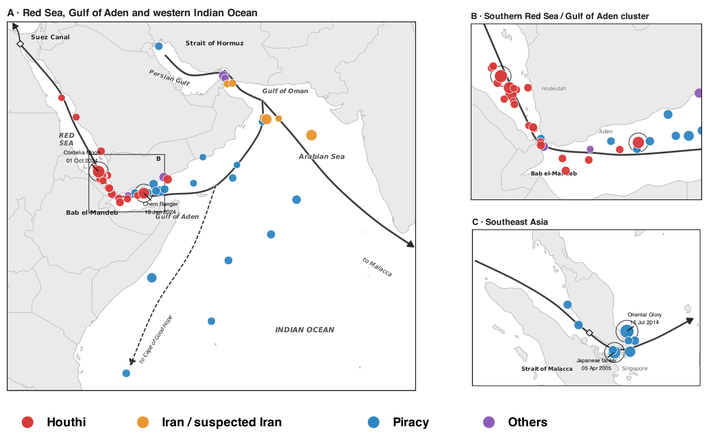


Crude grades

- Refineries run on a **given mix** of grades.
- **Hard to substitute.**
- Each grade is produced by only **a few countries**.

Empirical strategy



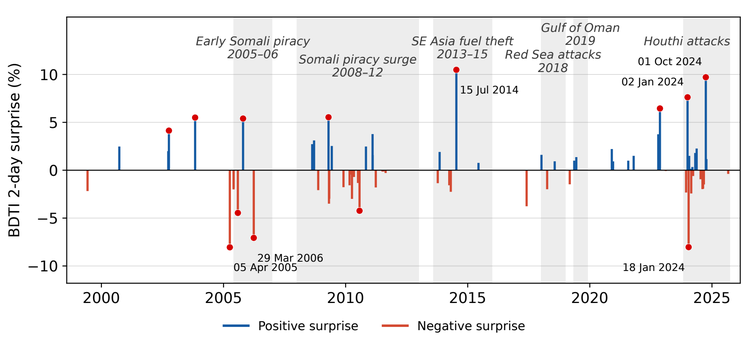


Event selection

- **72 attacks** on oil tankers, 1999–2025, reported by Reuters and Lloyd's List.
- **Excluded:** state seizures, military operations, events close to OPEC news, wars or COVID-19.

Daily surprises

- BDTI change over **2 days** around each attack.
- Not forecastable by high-frequency variables.



Monthly surprises

- **Behave like a shock:** no autocorrelation, not Granger-caused, orthogonal to known shocks.

Econometric framework

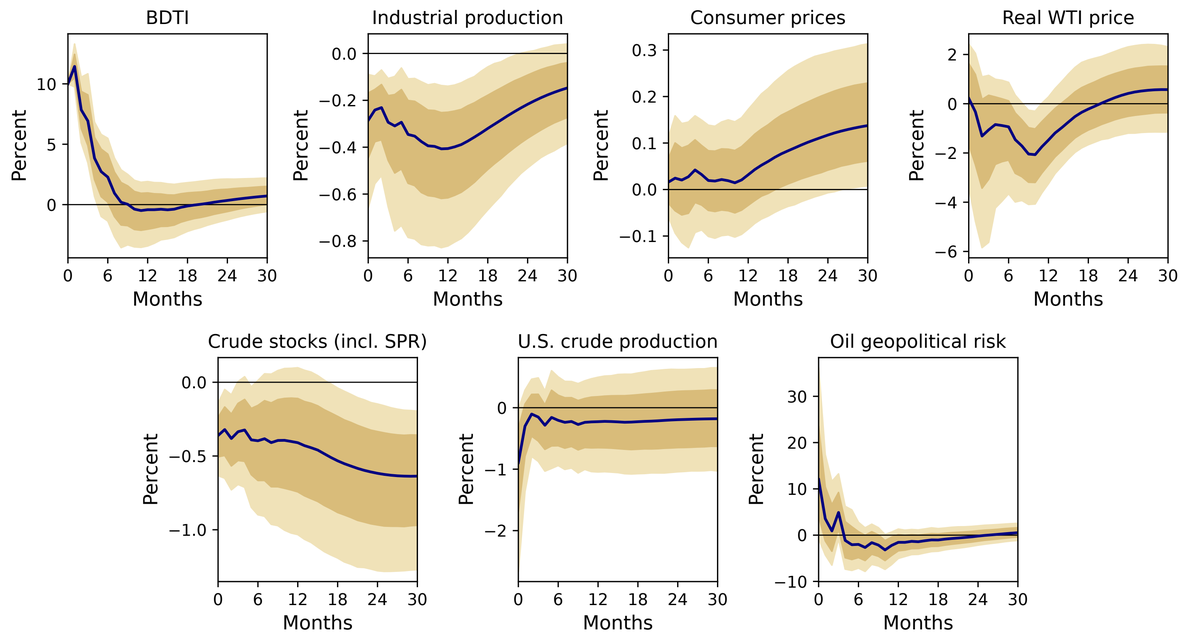
Goal: isolate an **oil-shipping-cost shock** $\varepsilon_{1,t}$: shipping costs due to attacks, not to oil demand, supply or congestion.

Proxy SVAR: monthly U.S. VAR (6 lags, linear trend, 1998M8–2026M2), with COVID adjustment (Hamilton, 2026) and moving-block bootstrap inference.

$$\underbrace{\mathbb{E}\left[z_t\,\varepsilon_{1,t}\right] \neq 0}_{\text{relevance}}, \qquad \underbrace{\mathbb{E}\left[z_t\,\varepsilon_{2:n,t}\right] = \mathbf{0}}_{\text{exogeneity: selection, 2-day window}}$$

Result 1: Macroeconomic effects

BDTI +10% on impact; dark/light bands: 68%/90%; 5,000 bootstrap draws.



First stage: robust $F = 19.88$; $R^2 = 3.13\%$; adjusted $R^2 = 2.83\%$.

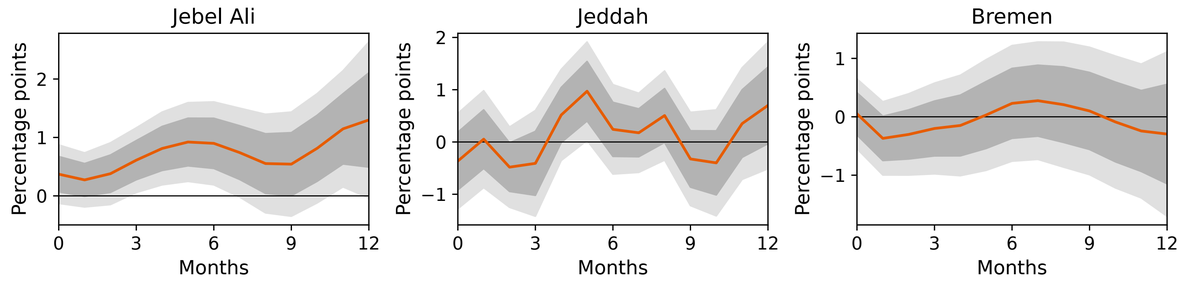
Different from a conventional oil-supply shock: oil prices do not rise and crude oil production does not move.

Effects specific to oil tanker attacks: attacks on other vessels raise freight rates, but have no significant macroeconomic effects.

Channel 1: Energy trade

Port congestion

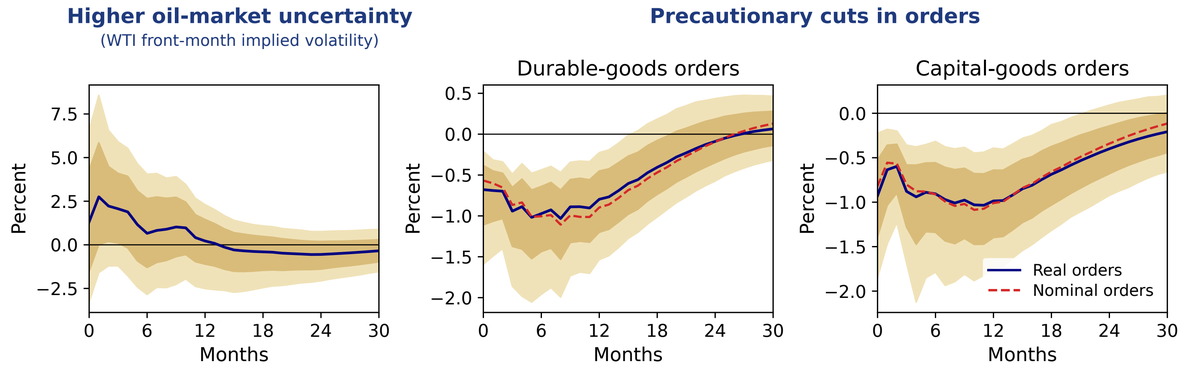
Smoothed Local Projections on the extracted SVAR-IV shock (Barnichon and Brownlees, 2019).



More port congestion → Less crude imported → Higher diesel and gasoline prices

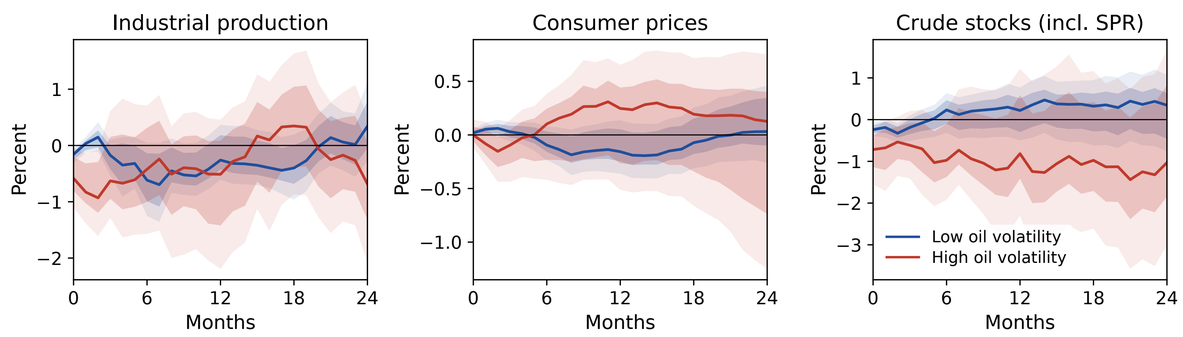
Imports: Saudi crude -2% after six months. **Fuel prices:** larger responses in districts whose refineries rely more on Persian Gulf crude.

Channel 2: Uncertainty and precautionary adjustments



The effects of attacks depend on the surrounding environment

Smooth-transition LP (Auerbach and Gorodnichenko, 2012)



Robustness

Instrument	event window, jackknife, positive only, monthly sum, random dates.
Confounders	purged of pre-trends, oil prices and oil-GPR.
Sample	ends 2023, starts 2010 (U.S. net exporter of petroleum products), COVID dummies, COVID window.
Model	12 lags, Bayesian VAR, local projections, internal instrument.
Controls	T-bill, shadow rate, S&P 500, VIX, OVX; add oil and dry-bulk shipping shocks.
Freight index	clean tankers, dry bulk.

Ongoing work

- **Europe and Japan** (other routes).
- **Weekly and daily analysis.**
- **Additional microdata:** AIS + tanker fixtures.
- **Quantitative model:** delays, transport risk, signal extraction.