Geopolitical Risk and Tanker Freight Rate Persistence

A Comparative Event Study of 45 Historical Events

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Pu Yu Hsu (Student ID: 271415)

Summary

Many literature most likely to focus on geopolitical risk and energy prices, the direct relationship between specific categories of geopolitical shock and the persistence of tanker freight rates remains largely unexplored. Therefore, this study dedicatee to addresses that gap by collecting 45 major historical events from 2000 to 2026. Events are classified into 7 main categories, and each category has at least 4 sub-categories. By using Cumulative Abnormal Rates (CAR) of the Baltic Dirty Tanker Index (BDTI) across 4 types of windows (anticipation, immediate, short-term, and medium-term), the primary measurement of persistence is the mean of the medium-term CAR . The findings reveal that the physical shocks remain longer effects on tanker freight rate market. Mainly geopolitical events —chokepoint closures, piracy, sanctions, wars, disasters have long-term effects on disrupting freight markets, and the rate of persistence and magnitude vary substantially by event type.

RESEARCH QUESTION

What types of geopolitical risk or shock cause the most persistent effects on the tanker freight rate?

METHODOLOGY

Event Study Framework

Applied MacKinlay (1997) and Küster Simic & Lauenstein (2017) to BDTI daily freight rate data across 45 events (2000–2026).

Data Sources

- BDTI daily data — Clarksons Research (2000–2026)
- GPR Index — Caldara & Iacoviello (2026)
- 45 events classified across 7 categories

Quantitative Tool

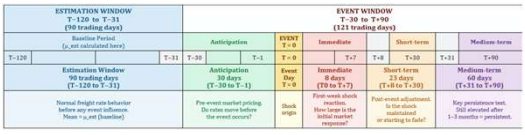
Python 3.14, pandas, NumPy, SciPy, and Matplotlib libraries

Abnormal Rate (AR)

$$AR_t = \frac{(BTDI_t - \mu_{est})}{\mu_{est}} \cdot 100$$

μ_est = mean BDTI over estimation window T−120 to T−31 (90 trading days)

Sub-periods (trading days)



Statistical Tests

- Pearson & Spearman rank correlation

RESULTS

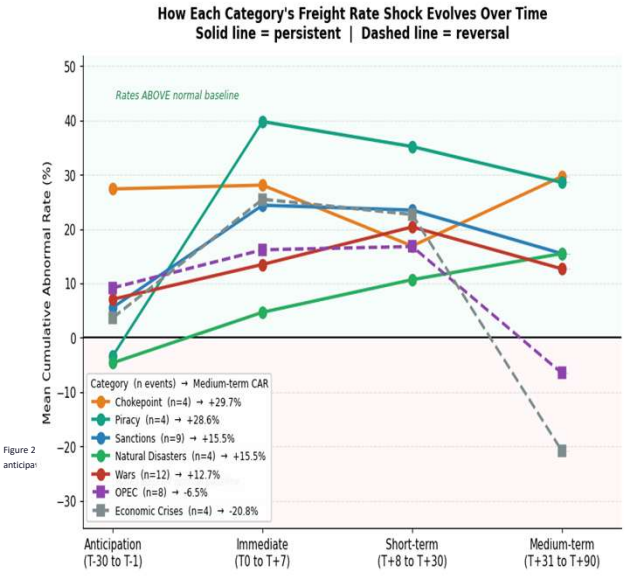
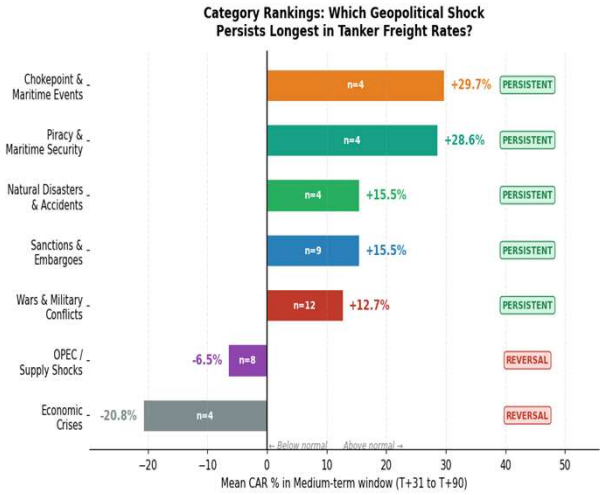


Figure 2
anticipa



GPR Correlation with BDTI

Statistically significant but weak (** p<0.01, * p<0.05). The GPR headline index explains only ~2% of freight rate variation, confirming that event type is a more reliable predictor than GPR level.

KEY FINDINGS

+29.7% — **Chokepoint & Maritime**
Most persistent — tonne-mile rerouting

+28.6% — **Piracy & Maritime Security**
Highly persistent — operating cost surge

+15.5% — **Sanctions & Embargoes**
Persistent — trade flow restriction

+15.5% — **Natural Disasters**
Persistent — supply interruption

+12.7% — **Wars & Military Conflicts**
Moderate — routes mostly intact

−6.5% — **OPEC / Supply Shocks**
Reversal — demand-side mechanism

−20.8% — **Economic Crises**
Strong reversal — demand destruction

IMPLICATIONS

For tanker practitioners and risk managers:

- While notice headline GPR indices for freight rate forecasting, it's even important to Monitor physical route conditions and fleet rerouting patterns.
- Chokepoint and piracy events should have faster position adjustment on war-related escalations of equivalent media salience.

CONCLUSION

The type and physical mechanism of a geopolitical shock is a more reliable predictor of tanker freight rate persistence than its political severity or GPR index level.

Chokepoint closures and piracy incidents trigger the ton-mile mechanism — compelled rerouting increases vessel-days per cargo unit, structurally tightening effective tanker supply.

Demand-side shocks (economic crises, OPEC cuts) consistently produce medium-term reversals as oil trade volumes contract without any offsetting supply-side constraint.