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ASSESSMENT OF THE SUSTAINABILITY OF THE MARINE INSURANCE MARKET IN THE BLACK SEA UNDER HEIGHTENED OPERATIONAL AND FINANCIAL RISK

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ABSTRACT

This paper analyzes the sustainability of the marine insurance market in the Black Sea region amid ongoing geopolitical instability and an escalating risk environment. It examines the impacts of operational risks (military actions, sea mine hazards, rerouting) and financial risks (surging war risk premiums, sanctions regimes, elevated freight rates) on vessel insurance coverage. The adaptation mechanisms of insurers and Protection & Indemnity (P&I) Clubs are evaluated alongside the broader implications for maritime supply chain security and transport economics in the Black Sea basin.

KEYWORDS: *Marine Insurance, Black Sea, War Risk, Market Sustainability, Operational Risk, Maritime Economics*

1. INTRODUCTION AND SPECIFICS AND STRUCTURE OF THE BLACK SEA MARINE INSURANCE MARKET

Maritime transport carries over 80% of global trade by volume, and the Black Sea basin represents a critical strategic crossroads connecting Eastern Europe, the Caucasus, Central Asia, and the Mediterranean. The region is vital for the global export of essential bulk commodities, including grains, energy products, fertilizers, and structural metals. However, the escalation of armed conflict and target-driven attacks on commercial shipping in recent years have fundamentally transformed the Black Sea into the world's most hazardous maritime corridor, surpassing even traditional high-risk zones like the Strait of Hormuz and the Southern Red Sea in terms of seafarer casualties and vessel losses.

The current operational realities in the Black Sea reflect an unprecedented surge in kinetic and asymmetric physical threats to commercial navigation. Severe hazards include drifting sea mines—which continue to pose severe navigation risks across international waters, including near the Exclusive Economic Zones (EEZs) of Bulgaria, Romania, and Türkiye—alongside targeted missile strikes and sea/aerial drone attacks on merchant shipping. This escalation has led to the actual sinking or severe constructive total loss (CTL) of multiple commercial vessels—ranging from general cargo ships and bulk carriers to chemical/oil tankers—along with significant fatalities among merchant crew members. Recent incidents involving sunk merchant vessels (such as the loss of vessels like Alfa Watan, HS Dignity, and Khoryv) under various international flags have dramatically heightened total loss claims and forced underwriters to re-evaluate physical loss probabilities [1,3,5].

These physical vessel losses have triggered severe financial and structural repercussions across the maritime insurance ecosystem:

- Escalation of War Risk Premiums, Following repeated strikes and vessel sinkings, Lloyd's Joint War Committee (JWC) expanded its Listed Areas across virtually the entire Black Sea basin. Consequently, War Risk Additional Premiums (AP) spiked sharply—reaching up to 0.5%–1.5% of a vessel's total insured hull value for a standard 7-day breach period, effectively doubling or tripling voyage expenses for single transits.
- Reinsurance Capacity Constriction & Exclusions, Severe hull loss claims have prompted major international reinsurers to strictly limit risk exposure in the Black Sea, introducing sweeping exclusions for war perils in standard annual Hull & Machinery (H&M) and Protection & Indemnity (P&I) policies, thereby forcing operators into volatile, short-term breach insurance markets.
- Macroeconomic and Freight Rate Distortions, The compounding costs of high risk premiums, crew war-bonus compensations, and risk mitigation measures have inflated maritime freight rates by 15% to 40%, directly affecting commodity prices, vessel chartering economics, and regional supply chain security.

Under these extraordinary conditions, marine insurance serves as a fundamental economic stabilizer. Without adequate, viable insurance coverage, shipowners and vessel operators face catastrophic financial exposure, threatening to halt commercial traffic entirely. The objective of this paper is to conduct a systematic assessment of the sustainability of the marine insurance market in the Black Sea by examining insurer responses to compounding operational hazards—specifically focusing on vessel sinkings and total losses—and evaluating their direct impacts on freight economics and maritime trade continuity in the region.

2. RISK FACTOR ANALYSIS IN THE BLACK SEA REGION

The sustainability of the marine insurance market in the Black Sea basin is strained by two closely intertwined vectors of exposure: operational (physical) risks and financial (underwriting/macroeconomic) risks. The interaction between these vectors directly governs market pricing and capacity availability.

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2.1. Operational risk in the Black Sea is defined by direct kinetic threats and physical navigation hazards that increase the probability of total loss (TL) and severe partial loss claims:

- Drifting Sea Mine Hazards: The deployment and detachment of sea mines created a persistent threat across international shipping lanes. Mine encounters off coastal waters of Romania, Bulgaria, and Türkiye demonstrate that physical hazards extend far beyond immediate conflict zones, requiring continuous mine countermeasure (MCM) surveillance and dynamic route adjustments.
- Direct Attacks and Vessel Sinkings: Commercial shipping has suffered direct physical damage from missile strikes, aerial drones, and uncrewed surface vessels (USVs). Recent sinking events and Constructive Total Loss (CTL) declarations involving bulkers and general cargo vessels have heightened underwriters' claims severity expectations.
- Port Infrastructure Vulnerabilities and Congestion: Attacks on grain terminals, fuel depots, and loading berths increase berth-side exposure. Extended port waiting times and mandatory night-navigation bans compound operational risks by increasing vessel exposure time in high-threat areas.
- Electronic Warfare and Navigational Spoofing: Widespread GPS/GNSS jamming and spoofing in the northern and western Black Sea severely degrade automatic identification systems (AIS) and bridge navigation equipment, raising collision and grounding risks.

2.2. Financial, Underwriting, and Economic Risks

2. The financial mechanisms of marine insurance have reacted dynamically to physical losses through rapid cost internalizations and structural market adjustments:

- Surging War Risk Additional Premiums (AP): War risk coverage is priced as an Additional Premium (AP) based on a percentage of the vessel's insured Hull Value over a 7-day breach window. During peak threat escalations, AP rates spiked from pre-conflict baseline levels (~0.025%) to 0.5%–1.0%+ of hull value per 7-day transit. For a $30M bulk carrier, this translates to $150,000–$300,000+ in extra insurance costs per voyage.
- Reinsurance Capacity Withdrawal and Exclusion Clauses: Following major hull claims, primary underwriters faced stringent reinsurance treaty exclusions. Reinsurers routinely removed Black Sea war risk coverage from standard annual policies, requiring standalone, short-term breach covers with restrictive sub-limits.
- Sanctions Compliance and P&I Cover Cancellations: Complex international sanctions, price-cap mechanisms on petroleum products, and shadow-fleet operations introduced significant legal and compliance risks for P&I Clubs, leading to conditional coverage cancellations and rigorous cargo origin verifications.
- Freight Rate Inflation and OPEX Escalation: High insurance premiums, elevated crew risk-bonuses (often 100% hazard pay increases), and extended voyage times escalated freight rates by 15% to 40%, directly increasing C&F (Cost & Freight) commodity prices.

Figure 1. Empirical correlation between War Risk Additional Premiums (AP %) and the Black Sea Freight Rate Index.

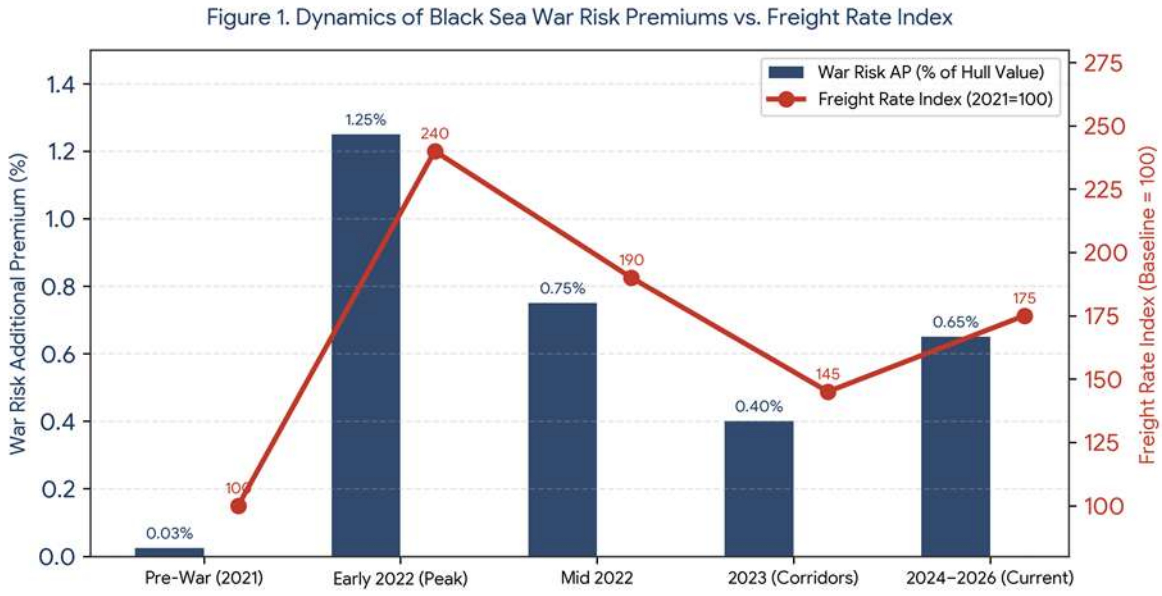


Figure 1 Analysis - The empirical data highlights a direct correlation between the escalation of War Risk Additional Premiums (AP) and the surge in the Black Sea Freight Rate Index. Prior to the geopolitical escalation, war risk premiums remained at a negligible baseline of ~0.025% of the vessel's hull value. Following the onset of military action and widespread vessel losses, AP rates spiked to a peak of 1.25%, driving the regional freight index up by 140% due to the immediate internalization of war peril costs by shipowners. Subsequent stabilization efforts—including state-backed safety corridors and dynamic underwriting pools—helped mitigate peak premium rates down to 0.40%–0.65%, yet freight rates remain structurally elevated at 45%–75% above pre-war baselines. This persistent cost delta underscores that risk-driven insurance surcharges have become a primary, long-term structural determinant of maritime transport economics in the Black Sea basin [2,4].

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Table 1: Detailed Matrix of Black Sea Risk Factors, Underwriting Metrics, and Economic Impacts

Risk Vector	Specific Black Sea Manifestations	Underwriting & Actuarial Impact	Economic & Supply Chain Consequences
Operational: Kinetic Threats	Drifting mines, drone/missile strikes, vessel sinkings (CTLs)	Spike in Total Loss claims; strict 7-day breach notice requirements	Vessel availability shortage; 15-40% freight rate surge; crew hazard pay spikes
Operational: Navigational	GPS spoofing/jamming, night bans, port congestion	Higher navigation accident frequency; increased collision/grounding risks	Voyage delays; increased fuel consumption; supply chain bottlenecks
Financial: War Risk Premiums	AP rates surging to 0.5%-1.0%+ of vessel hull value	Short-term dynamic pricing; daily risk rating adjustments	Up to $300k+ added voyage cost per vessel; commodity cost inflation
Financial: Reinsurance & P&I	Reinsurance treaty war exclusions; strict sanctions checks	Capacity contraction; requirement for specialized risk syndicates	Higher deductibles; reliance on state-backed guarantee facilities

3. ASSESSMENT OF MARINE INSURANCE MARKET SUSTAINABILITY

The market's resilience was demonstrated by its ability to maintain continuous coverage despite extreme loss volatility. Key to this stability was the flexibility of reinsurance syndicates and the implementation of innovative risk mechanisms, such as state-backed risk facility facilities and international syndicate pools supporting designated maritime safety corridors.

However, reinsurers responded by tightening capacity and excluding war risks from annual policies, shifting exposure entirely into short-term breach markets. This created a structural cost reallocation where vessel operators absorbed substantial risk premiums, ultimately passing these costs along to commodity prices and global supply chains

4. CONCLUSION AND RECOMMENDATIONS

The analysis demonstrates that the marine insurance market in the Black Sea has exhibited notable adaptability and operational resilience, preserving commercial maritime flows under severe geopolitical stress. Nevertheless, this market continuity has come at the cost of significantly higher maritime transport expenditures.

To enhance long-term market sustainability, the following measures are recommended:

- Risk Digitization & Real-time Tracking, Deploying advanced vessel tracking and risk monitoring technologies for precise, dynamic risk pricing.
- Public-Private Risk Sharing Mechanisms, Establishing regional public-private guarantee frameworks involving littoral states to absorb peak war risk liabilities.
- Tailored Policy Clauses, Negotiating flexible premium adjustments tied directly to proactive onboard security measures and AIS anti-spoofing protocols.

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