



Impact of Global Conflicts on Marine Logistics and Global Supply Chains: A Comparative Analysis of Maritime Chokepoint Disruptions (2022–2026)

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ABSTRACT

From February 2022 to September 2026, the global maritime system experienced two separate armed conflicts that affected different parts of its network: the Russo-Ukrainian war, which cut off normal commercial activity in the north-western Black Sea, and the growing conflict between the United States, Israel and Iran, which began in the Bab el-Mandeb in November 2023 and ended with the effective closure of the Strait of Hormuz on 28 February 2026. This paper asks how these two conflicts, both on their own and together, transmitted stress via maritime chokepoints into global supply chains and what the resulting costs were in terms of freight, insurance, economic output and human life. By applying an event-study approach and using data on public transit, freight, insurance and casualties across three chokepoint corridors, the study shows that the two conflicts are not equivalent shocks. The war in Ukraine was a commodity-market and tanker-related event which had no effect on container freight, while the closure of the Hormuz Strait resulted in the most severe chokepoint disruption recorded in modern times: daily traffic dropped from a baseline of 144 to between 5 and 14, war-risk premiums increased from 0.05 to 0.07% to 7.5 to 10% of hull value, and the daily assessed earnings of very large crude carriers reached USD 647,000. The paper also documents a mechanism which is largely missing from the current literature: the contraction of the seafarer labour supply due to conflict. During a six-month period in the Gulf region, there were sixty-five confirmed incidents and seventeen confirmed seafarer deaths, leading India, the world's second-largest crewing nation, to instruct operators to avoid sending Indian seafarers through the Strait, while market danger bonuses reached six months' salary for a single transit. The paper contends that the resilience of chokepoints is limited not just by sea room and hull capacity but also by the readiness of a geographically concentrated workforce to go on board, and that this labour constraint becomes binding more quickly than physical capacity.

Introduction

About 80 per cent of the world's merchandise trade in terms of volume is transported by sea, and a large portion of this traffic goes through a small number of narrow waterways (UNCTAD, 2024). Although this degree of concentration has always been a characteristic of maritime geography, it turned into a real policy issue in the first half of the 2020s when the global shipping system suffered an unusually high number of shocks. The COVID-19 pandemic disrupted port labour and container movements. In

2021 the Ever Given running aground shut the Suez Canal for six days. Drought caused a reduction in the number of Panama Canal transits in 2023. On top of this already stressed situation, two armed conflicts then hit the network directly.

The first of these events took place on 24 February 2022, when Russia launched an invasion of Ukraine. Soon afterwards, merchant ships were shelled and mined off Odesa, commercial operations at Ukrainian ports came to a stop and the north-western Black Sea turned into a war zone in which commercial navigation was at one time entirely impossible. The second instance is better seen as a series of events: since November 2023, Houthi forces in Yemen have been attacking merchant shipping in the southern Red Sea and the Gulf of Aden, as a result of which the vast majority of container traffic between Asia and Europe has had to take the route around the Cape of Good Hope. Hostilities directly between Israel and Iran in June 2025 temporarily increased tanker rates but did not affect container trade. Then, starting on 28 February 2026, the open war between Iran on the one hand and the United States and Israel on the other hand blocked the Strait of Hormuz to all but a small part of its normal traffic, a situation which had remained substantially unresolved at the time this paper was written in September 2026. Studying these events together is not simply a matter of convenience. The two conflicts overlapped in time, and their effects interacted in ways that a single-conflict study cannot capture. When Hormuz closed in 2026, some cargo that had abandoned the Suez route during the Red Sea crisis returned to it, so that one conflict's chokepoint closure partially reversed the diversion caused by the other (gCaptain, 2026). Suez Canal transits in July 2026 were 27% higher than a year earlier, and monthly toll revenue reached its highest level since December 2023, even though the underlying Red Sea security situation had not fundamentally improved. A framework that treats each dispute as an isolated perturbation of an otherwise stable network will misread that behaviour.

There is another reason in considering the two cases together. The way in which they differ provides analytically useful information. The Black Sea corridor is a dead end since a vessel that cannot go through the Bosphorus has no other route to Odesa. The Bab el-Mandeb has an expensive but actual alternative via the Cape of Good Hope. The Strait of Hormuz has essentially no such alternative, the cargo starting within the Gulf and the bypass pipeline capacity being limited to 3.5–5.5 million barrels per day as against the normal flow of about 20 million barrels per day (IEA, 2026). When three corridors with different possibilities for substitution are compared, each being struck by different weapons and operating under different legal regimes, this leads to the inference that no single case can do so.

This paper offers two contributions. The first one is integrative in that it sets both conflicts within one analytical system and demonstrates that they involve different kinds of shock, a point that is important since the policy response suitable for one does not apply to the other. The second contribution is substantive; the current collection of research on conflict and maritime logistics is mostly focused on vessels, routes, cargo and cost and says very little about the people on board. The paper gives a detailed account of the seafarer labour channel and contends that it represents a binding constraint on chokepoint throughput which is conceptually different from and, in the case of the 2026 Gulf incident, operated more quickly than the physical constraint.

The study includes the period from February 2022 to early September 2026 and looks at three chokepoint systems: The Turkish Straits and the north-western Black Sea; the Bab el-Mandeb, the Red Sea and the Suez Canal; and the Strait of Hormuz and the Arabian Gulf. The Cape of Good Hope is considered a substitute route and not a chokepoint, while Panama is left out since its constraint between 2023 and 2024 was hydraulic rather than military.

At the beginning it is necessary to mention three limitations. The Gulf conflict in 2026 was still going on when this was written, so the figures relating to that area are only provisional and there is as yet no official statistical series to cover it. The data from the automatic identification system (AIS), which is the basis for most of the transit figures, is systematically compromised in the Gulf theatre in 2026 since a large number of ships transit with their transponders switched off. As for the casualty figures for the Black Sea, these are disputed, the International Maritime Organization stating in September 2026 that the exact numbers cannot be confirmed. These limitations are dealt with in full in Section 3.4 rather than simply being noted and ignored.

Literature Review

Maritime Network Disruption and Vessel-Trajectory Analysis

The first is a detailed network analysis on AIS data relating to vessel movements in order to assess the way in which conflicts alter maritime connectivity. Cong et al. (2024) offer the methodological basis for the analysis of the Ukraine case, examining vessel trajectories on both the twenty days before and the twenty days after 24 February 2022 and thus developing a strong framework which integrates network indicators with performance indicators. Their main finding is both contrary to expectation

and relevant to the current paper: even though shipping activity dropped sharply in the affected area, global network connectivity rose by 27.2 per cent, network scale increased by 36.6 per cent, density went up by 32.4 per cent and net resilience increased by 18.6 per cent. To put it simply, the global network coped with the closure of the Black Sea by reorganising around it and ended up being measurably better connected than before. This strongly challenges the idea that a regional maritime conflict must necessarily lead to a deterioration in global network performance.

Ke et al. (2025) apply a similar approach to liquefied natural gas (LNG) shipping across 2021–2023, finding network fragmentation and lowered efficiency, with European ports gaining prominence as substitutes for Russian supply while Ras Laffan in Qatar retained its structural centrality. Their conclusion that degree-based disruptions pose the greatest risk to system dependability is directly relevant to the 2026 Hormuz case, since Ras Laffan lies inside the closed strait.

Węcel et al. (2024) compare the impact of the COVID-19 pandemic and the Ukraine war on maritime traffic, and this study is especially important since it demonstrates that different types of shock lead to different traffic patterns. Yap and Yang (2024) examine the effect of the Red Sea crisis on calls at container ports, and Zhang and Liu (2026) build on this by using a difference-in-differences approach across sixteen major container ports and 672 port-quarter observations, finding an average reduction of 29.5% in throughput at the ports in the treatment group, the effect becoming stronger over time from a coefficient of -0.201 in the first quarter to -0.338 in the fourth. The findings regarding heterogeneity have important ramifications for policy, since hub ports experienced only 43% of the throughput decline that was seen at non-hub ports, and ports located in areas of low political risk were found to be considerably more resilient than those in high-risk areas.

Supply Chain Resilience and Systematic Reviews

The second approach views conflict through the lens of supply chain resilience. According to Sarwar and Rye (2025), a systematic review of 22 peer-reviewed studies on the supply chain effects of the Russia-Ukraine war that complies with PRISMA identifies five areas of impact—food security, energy volatility, critical materials, transport bottlenecks and the financial market response—and brings to light the issue of asymmetric regional vulnerability, with developing economies being disproportionately affected. The fact that they found the conflict to have caused permanent rather than short-term changes in supply chain configuration is in line with the transit data given in Section 4.

There is also a systematic review which looks at the impact of the US-Israel-Iran conflict on trade flows (Baltic Journal of Economic Studies, n.d.). The fact that there are systematic reviews dealing with the two conflicts separately but none that address them together is itself proof of the gap referred to in this paper.

Shipping Costs, Insurance and Macroeconomic Transmission

The third factor is economic. As shown by Carrière-Swallow et al. (2023), analysis covering 46 countries over three decades indicates that if global shipping costs double, headline consumer price inflation rises by about 0.7 percentage points, with around 90% of the effect being passed on to import prices within two months, the impact on consumer prices reaching its peak after about twelve months and remaining significant for eighteen months. This comparative result is at the heart of the current argument since oil price shocks reach their peak after two months and food price shocks after about seven months, whereas shipping cost shocks peak after twelve months making them the most persistent of the three. The authors state that the 2021 surge in container costs accounted for approximately two percentage points of global inflation in 2022.

The study carried out by the ITF/OECD in 2024 on the Red Sea crisis gives a breakdown of the operating expenses involved in taking alternative routes: it involves an extra 8,500 nautical miles on a round trip from the Far East to Europe, ten extra days in each direction, a 33 per cent higher fuel consumption at constant speed, and an extra cost of between USD 1 million and 1.7 million per journey for a typical vessel with a capacity of 12,500 TEU. The UNCTAD (2024) report provides the complementary perspective regarding trade facilitation and finds that the longer routes have reduced the effective global container shipping capacity by 9 per cent.

Seafarer Labour, Rights and Welfare

The fourth stream is the smallest and has the least connection with the others. When the Ukraine war began, the International Chamber of Shipping (2022) stated that Russians and Ukrainians together made up 14.5% of the world's seafaring workforce. The BIMCO/ICS Seafarer Workforce Report 2026 shows a shortage of 39,100 certified officers compared to a total seafarer supply

of 2,565,580, and notes that India has risen to second place among the countries that supply seafarers. The report, however, attributes the shortage to issues relating to recruitment and retention rather than to the armed conflict.

The International Transport Workers' Federation has recorded the contractual framework that regulates seafarers in war zones, covering the identification of areas where warlike operations take place and the corresponding rights of refusal and repatriation (ITF, 2024; ITF & JNG, 2026). Human Rights Watch (2025) has described some of the attacks on merchant crews as constituting apparent war crimes.

The Gap

Three gaps can be identified. The first is that no peer-reviewed study has examined the two conflicts together, even though they overlap in time and have a clear interaction. The second is that the labour stream is not incorporated with the network and economics streams: the report on the workforce does not regard conflict as a driver of supply and the network studies do not consider crew availability as a constraint. The third is that the 2026 closure of Hormuz is so recent that it has not yet been the subject of any peer-reviewed study; as a result, the most severe chokepoint disruption in recent times is currently recorded almost entirely in institutional and trade sources. The present paper considers all three of these points.

Methodology and Conceptual Framework

Research Design

The study uses a comparative event-study approach focused on three chokepoint corridors, this being augmented by a structured review of secondary sources. It is classified as belonging to the quantitative/empirical category not the optimisation or single-case categories since its aim is to describe the behaviour of the system as observed in various events rather than to arrive at an optimal routing or to model one port in depth.

Each corridor is considered as a separate unit of observation, with a specific treatment date—24 February 2022 in the case of the Black Sea, 19 November 2023 for the Red Sea, and 28 February 2026 for the Strait of Hormuz. For each corridor the study puts together baseline data before the treatment and observations after the treatment across four areas of measurement: physical throughput, cost, macroeconomic transmission, and human cost. The study makes comparisons both within each corridor at different points in time and between the corridors at corresponding stages in their event cycles.

The fact that the three events last for different lengths of time — 54 months for the Black Sea, 33 for the Red Sea, and six for Hormuz — means that the unadjusted figures are misleading, and the study therefore gives intensity-normalised figures in all cases where comparisons are made between corridors. This is particularly important when it comes to casualty figures, since although the Black Sea has the highest absolute number of deaths the Gulf has by a large margin the highest fatality rate per month of conflict.

Data Sources

The physical throughput data is obtained from four different types of source: official statistical series from the US Energy Information Administration's chokepoint dataset, the International Energy Agency, the Suez Canal Authority's annual navigation reports, and the Ukrainian Sea Ports Authority; intergovernmental analysis from UNCTAD's Review of Maritime Transport and its Red Sea assessments, and from the ITF/OECD; commercial maritime intelligence from Lloyd's List Intelligence and Kpler; and AIS-derived transit counts from the IMF PortWatch platform, accessed through secondary reporting.

The freight cost data uses the Drewry World Container Index, the Freightos Baltic Index, the Shanghai Containerized Freight Index, the Baltic Dry Index and the Baltic Dirty and Clean Tanker Indices, along with published tanker timecharter equivalent assessments, while carrier surcharge data is, wherever possible, obtained from the carriers' own published notices rather than from press summaries.

The insurance data is obtained from broker and underwriter statements provided by S&P Global Commodity Insights along with Reuters, as well as from the Lloyd's Market Association Joint War Committee's listed areas circulars. The casualty and labour data is obtained from the IMO's incident reporting system, the UK Maritime Trade Operations Centre, the Philippine Department of Migrant Workers, India's Directorate General of Maritime Administration, the ITF and the BIMCO/ICS workforce report.

Conceptual Framework

The paper presents a four-stage transmission model as set out below, this model being used to organise the empirical material in Sections 4 and 5. The first stage involves the conflict event, which is a physical or legal action that increases the cost that is anticipated for using a corridor; this can be a physical attack, a declared closure, a threat from a mine, or the withdrawal of insurance coverage.

In stage two there is chokepoint stress: the expected transit cost rises above the level at which operators will proceed, as a result of which throughput decreases. What is important is that the answer is not continuous; since war-risk cover is a necessary condition for trading and for complying with charterparty terms, its withdrawal causes a discontinuity and so that throughput collapses rather than dropping smoothly.

Stage three involves a logistical response, and this response is able to be seen in four ways: by rerouting when an alternative is available; by making price changes via freight rates, premiums and surcharges; by withdrawing capacity through blank sailings and by refusing to fix; and by taking action regarding labour, which includes offering danger bonuses, refusing to sail, and having state-imposed restrictions on deployment. The fourth of these measures is the one that this paper includes in the traditional explanation.

Stage four involves economic transmission and covers both short, medium and long-term horizons, the lag structure for which was established by Carrière-Swallow et al. (2023).

The main idea put forward by the model is that the severity of stage four depends on whether a stage-three response is available. In cases where rerouting is possible, such as in the Red Sea, costs go up but the volume remains the same; but where it is not possible, as is the case at Hormuz, volume collapses and price ceases to be a reliable indicator of actual activity since the quoted rates instead represent risk pricing on low-volume transactions as opposed to reflecting the real transport economics.

Methodological Limitations

Because of four limitations, it is necessary to give explicit attention to the point rather than putting it in a footnote.

The issue of AIS degradation. The figure for tanker crossings of the Strait of Hormuz in 2026 is based on AIS data, but Lloyd's List Intelligence stated that about 70% of the tanker crossings observed in mid-July 2026 had AIS switched off, as compared with 55% one week earlier and 42% two weeks before that. Since the volumes calculated from AIS data therefore include a missing amount that varies over time, the AIS-derived figures are underestimated by an amount that is unknown and changes with time; the direction of the bias is known but not its extent.

The issue concerning data disputes. In September 2026 the ship-tracking companies stated that there were between 5 and 14 transits through the Hormuz Strait each day, whereas the United States government said that the figure was 30 to 40 vessels with a volume of 10 to 18 million barrels per day (Al Jazeera, 2026a). There is a discrepancy between the two sources of a factor of two to four, both of which are generally considered to be credible. The paper cites both figures without deciding which is correct.

The issue of synthetic prices. According to reports in the trade press, the extreme assessments for very large crude carriers (VLCC) in March 2026 were due to thin liquidity, the failure of or lack of repeatability in fixtures, and a war-risk premium having been included in the freight rate (Seatrade Maritime, 2026). These should correctly be referred to as assessed benchmark levels and not as realised earnings, and they are presented in that way throughout.

The problem of belligerent sources. The data on casualties and incidents in the Black Sea is mainly obtained from sources affiliated with the Ukrainian government and from monitoring groups that support Ukraine. The International Maritime Organization stated in September 2026 that it was not possible to verify the exact figures for the Black Sea since verification is difficult and false information is frequently issued by the conflicting sides (UN News, 2026b). For this reason, the casualty figures for the Black Sea in the present paper are given as verified minimums which have been compiled from individual incidents that have been named and reported separately, not as total numbers.

Results and Numerical Analysis

Chokepoint Throughput

The Strait of Hormuz

The Strait of Hormuz is the world's most important maritime chokepoint and experienced the greatest disruption in recent times in 2026. The International Energy Agency (2026) stated that some 20 million barrels per day of crude oil and petroleum products passed through the strait in 2025; this represents approximately 25% of the global seaborne oil trade and 34% of the seaborne crude oil trade, together with just over 112 billion cubic metres of LNG, or almost 20% of the world's LNG trade. Around 93% of Qatar's and 96% of the United Arab Emirates' LNG exports pass through the strait, and together Bangladesh, India and Pakistan get almost two-thirds of their LNG from this route. About 80% of the oil is shipped to Asia; Europe receives only about 4%.

UNCTAD's figures for 2025 show that the level of traffic before the conflict was an average of 144 vessel crossings each day in mid-June 2025, comprising 37% tankers, 17% container ships and 13% bulk carriers, equivalent to more than 42,400 vessels per year and accounting for 11% of global maritime trade by weight.

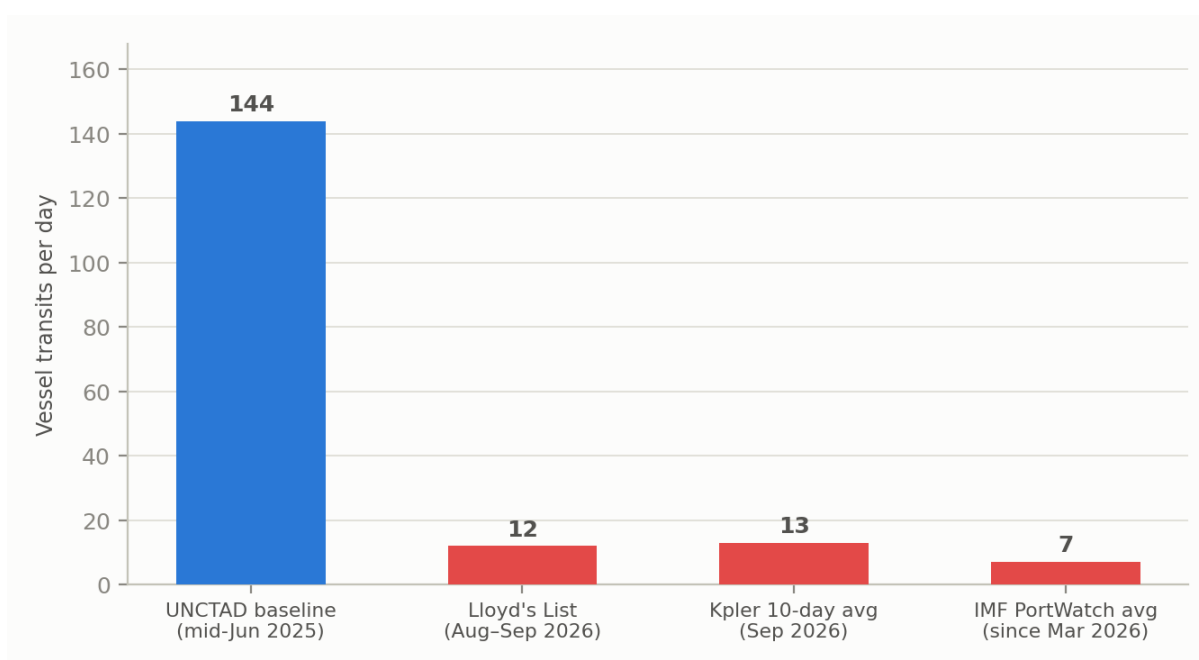


Figure 1. Daily vessel transits through the Strait of Hormuz. Sources: UNCTAD (2025) for the baseline; Lloyd's List Intelligence (2026b), Kpler and IMF PortWatch via Al Jazeera (2026a) for the crisis period.

The collapse compared with the baseline figure was almost total. Between 13 and 19 July 2026, Lloyd's List Intelligence recorded 25 transits made by ships not associated with Iran, which was a drop from 108 the week before, with total traffic having fallen by about 90% on an annual basis. The number of VLCC transits had fallen to nine from 35 the week prior. By the end of August and the start of September 2026, ship-tracking companies were reporting an average of 13 vessels per day over a ten-day period (Kpler), 12 per day (Lloyd's List Intelligence) and an average of seven per day since March 2026 (IMF PortWatch). On the basis of the peace-time level of 144, this amounts to a drop of about 90 to 95%.

The physical effects were at once noticeable in the countries involved in production. In Kuwait the number of port calls in the region fell by 86 per cent, in the United Arab Emirates by 69 per cent (this amounted to a reduction from 78 to 24 calls per day), and in Qatar, Iraq and Bahrain the figure dropped by about two-thirds. Saudi Arabia experienced a decline in output of only 15 per cent, since it is the only major Gulf producer to have substantial Red Sea bypass facilities at Yanbu (Al Jazeera, 2026b). Gulf crude exports declined by approximately 47 per cent, falling from about 17 million barrels per day in 2025 to about 9 million barrels in August 2026.

The effect of LNG was more structurally negative than that of oil because it could not be substituted quickly. On 4 March 2026 Qatar Energy stated that it was facing force majeure, and following the strikes at Ras Laffan about 17% of Qatar's liquefaction capacity became inoperative, with the repair work taking several years. The country does not have an LNG pipeline that bypasses the strait.

The Bab el-Mandeb, Red Sea and Suez Canal

A significant difference between the Red Sea route and the route via Hormuz is that there is an alternative. The data shows this by showing a redistribution rather than a total cessation.

The data provided by the ITF/OECD regarding the immediate reallocation of traffic between 1 November 2023 and 28 February 2024 indicate that the number of ships passing through Suez fell by 55%, the number going through the Bab el-Mandeb decreased by 55%, and traffic via the Cape of Good Hope rose by 130%. The fact that the drop in traffic through the Bab el-Mandeb is so clear is significant because it reflects exactly the level of cargo substitutability and the sensitivity of insurance coverage: container ships dropped by 75%, LNG carriers by 100%, LPG carriers by 88%, bulk carriers by 45% and crude tankers by 32%. The cargoes which ceased altogether were those for which the owners could not obtain insurance or had decided not to pay for it; the cargoes which continued were those whose routing was the least elastic.

UNCTAD (2024) reported a 42% decrease in Suez transits compared to the level in October 2021, a 82% drop in the container tonnage passing through the Suez by mid-February 2024, and a 70% reduction in the tonnage going through the Gulf of Aden. As for the literature concerning resilience, UNCTAD found that longer routes reduced the effective global container shipping capacity by 9% since the ships take more time at sea for each unit of cargo delivered.

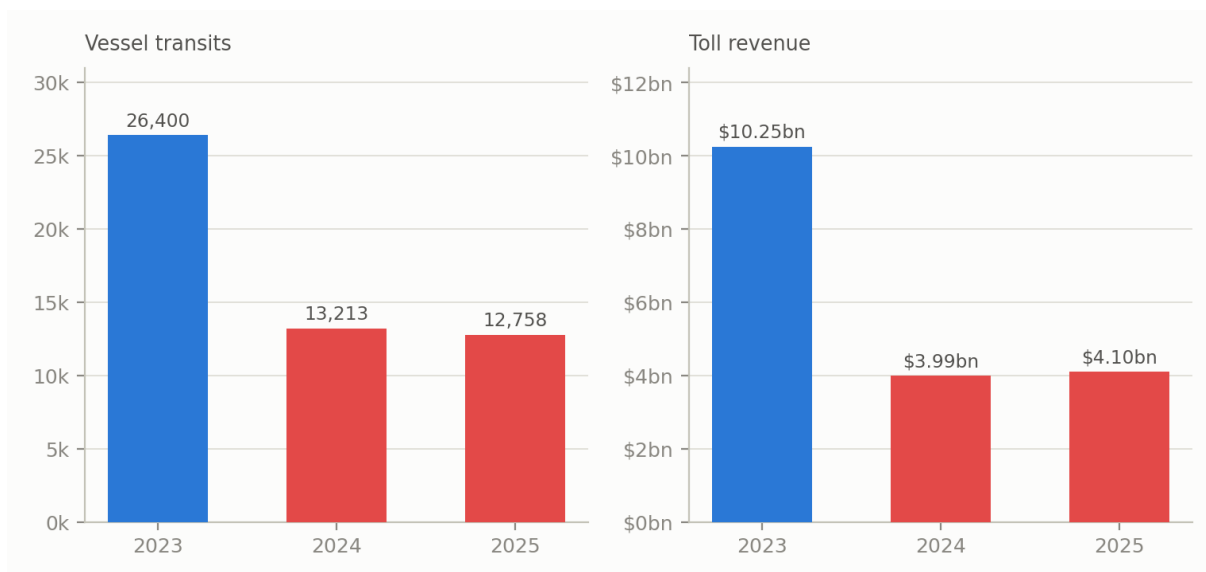


Figure 2. Suez Canal traffic and revenue before and after the Red Sea crisis. Source: Suez Canal Authority (2026); Euronews (2025) and Egypt Today (2025) for 2023–2024 revenue.

Statistics from the Suez Canal Authority itself show the effect has continued. The number of ships using the canal dropped from about 26,400 in 2023 to 13,213 in 2024, a reduction of around 50 per cent, and the toll income fell from USD 10.25 billion to USD 3.99 billion, a decrease of 61 per cent. A significant and less widely reported point is that in 2025 the number of transits was only very slightly lower than in 2024, standing at 12,758 vessels, which represents a further decline of 3.4 per cent. The crisis did not reach its lowest point in the first year. According to UNCTAD (2025), Suez Canal tonnage transits were still about 70 per cent below the 2023 average as late as May 2025.

Recovery did not start until 2026 and was caused by the other conflict. In July 2026 the number of ships passing through the Suez Canal was 1,340 compared with 1,055 in July 2025, representing an increase of 27%, while monthly revenue reached USD 505 million, a year-on-year rise of 42% and the highest figure since December 2023 (gCaptain, 2026). Annual revenue for the 2025/26 fiscal year amounted to USD 4.67 billion, which is a 23% increase on the previous year. The reason for this is that the

closure of the Hormuz Strait diverted cargo onto the route via Egypt. A failure of one conflict's chokepoint had the effect of partially reversing the diversion caused by the other conflict.

The Turkish Straits and the Black Sea

The situation concerning transit through the Black Sea is the most complicated because the overall transit figures conceal a change in composition.

The number of vessels passing through the Bosphorus fell from 38,551 in 2021 to 35,146 in 2022, a decrease of 8.8 per cent, before increasing to around 39,000 in 2023. On this basis the conflict seems to have had only a minor impact. Yet cargo tonnage through the Bosphorus dropped from 465.4 million tonnes in 2021 to 383.3 million tonnes in 2022, a 17.6 per cent reduction – about twice the rate at which the number of vessels declined – suggesting a shift toward smaller ships. At the same time, figures from the EIA indicate that oil traffic via the Turkish Straits has been rising during the war, rising from 6.4 million barrels per day in 2022 to 7.0 million in the first half of 2025 as Russian crude oil has been redirected from European to Asian markets.

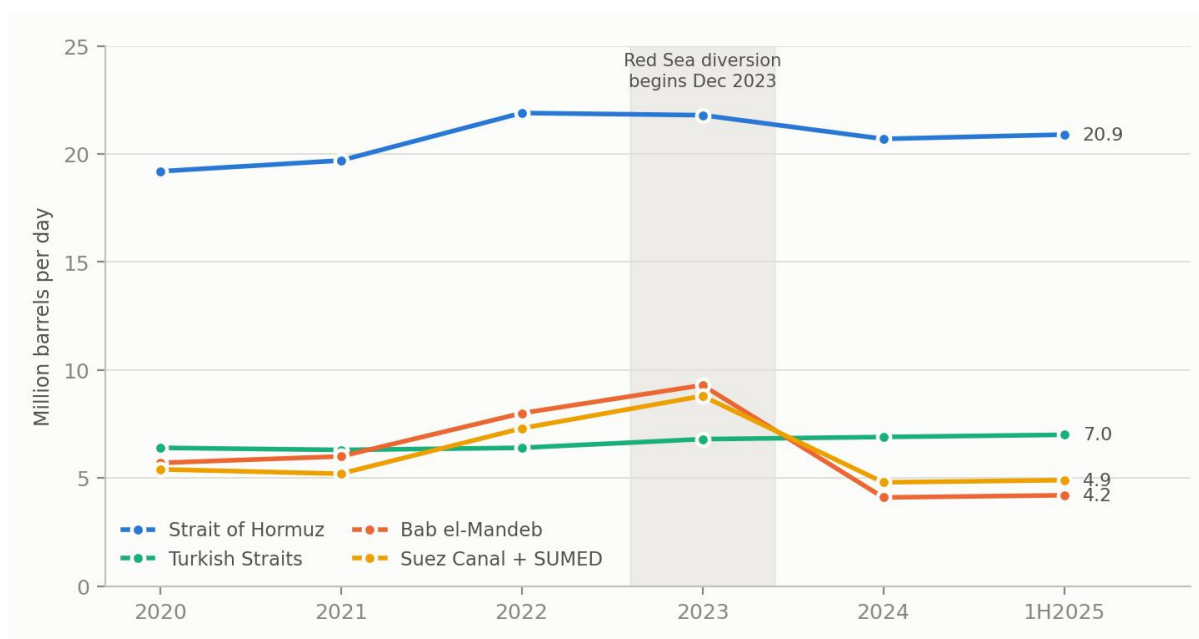


Figure 3. Seaborne oil transit volumes through four chokepoints, 2020-2025. Source: US Energy Information Administration (2026), World Oil Transit Chokepoints, covering 2020 to the first half of 2025.

Figure 3 shows the divergence clearly. The volumes in the Hormuz Strait and in the Turkish Straits either stayed the same or increased during the period under review; from 2023 to 2024 both the Bab el-Mandeb and the Suez Canal, including SUMED, decreased, the Bab el-Mandeb falling from 9.3 to 4.1 million barrels per day and the Suez Canal including SUMED dropping from 8.8 to 4.8. The two conflicts have opposite effects on this measure: the war in Ukraine led to oil being sent through a chokepoint, while the Red Sea crisis caused oil to be diverted away from that region.

The Ukrainian ports show the most significant individual country impact in the dataset; the total seaport throughput dropped from 153.3 million tonnes in 2021 to 51.2 million in 2022, a decrease of about 67%, before rising to 62 million tonnes in 2023, then reaching 97.2 million tonnes in 2024 and 82.2 million tonnes in 2025 (Ukrainian Sea Ports Authority, 2026). In 2024 the Greater Odesa ports more than doubled or tripled their 2023 volumes: Pivdennyi increased from 10.08 to 35.55 million tonnes, Chornomorsk from 11.41 to 26.04 million and Odesa from 8.41 to 18.3 million.

An especially noteworthy conclusion is the comparison between the two Ukrainian export arrangements. The Black Sea Grain Initiative, which was negotiated with Russia's approval and which ran from July 2022 to July 2023, saw 32.9 million tonnes of grain and food products transported using 730 ships on 1,004 trips, the highest monthly amount being 4.2 million tonnes in October 2022 (United Nations, 2023). The unilateral Ukrainian maritime corridor, set up in August 2023 without Russian consent and defended by force, has so far handled a total of 120 million tonnes, including 28 million tonnes in 2025 alone (Ministry for

Development of Communities and Territories of Ukraine, 2026). The corridor established despite opposition from the adversary has therefore greatly outperformed the one established with the adversary's agreement.

Table 1. Chokepoint throughput: pre-conflict baseline against crisis level

Corridor	Measure	Baseline	Crisis level	Change
Strait of Hormuz	Vessel transits per day	144 (mid-Jun 2025)	5-14 (Mar-Sep 2026)	-90% to -95%
Strait of Hormuz	Gulf crude exports	~17 mb/d (2025)	~9 mb/d (Aug 2026)	-47%
Suez Canal	Vessel transits per year	~26,400 (2023)	12,758 (2025)	-52%
Suez Canal	Toll revenue	\$10.25bn (2023)	\$3.99bn (2024)	-61%
Bab el-Mandeb	Oil transit	9.3 mb/d (2023)	4.1 mb/d (2024)	-56%
Bab el-Mandeb	Container transits	Nov 2023 level	Feb 2024 level	-75%
Cape of Good Hope	Route traffic	Nov 2023 level	Feb 2024 level	+130%
Bosphorus	Vessel transits per year	38,551 (2021)	35,146 (2022)	-8.8%
Bosphorus	Cargo tonnage	465.4 Mt (2021)	383.3 Mt (2022)	-17.6%
Ukrainian seaports	Total throughput	153.3 Mt (2021)	51.2 Mt (2022)	-67%

Freight Rate Transmission

The Container Market

The key negative finding of this study is that the Russo-Ukrainian war was not a container freight event.

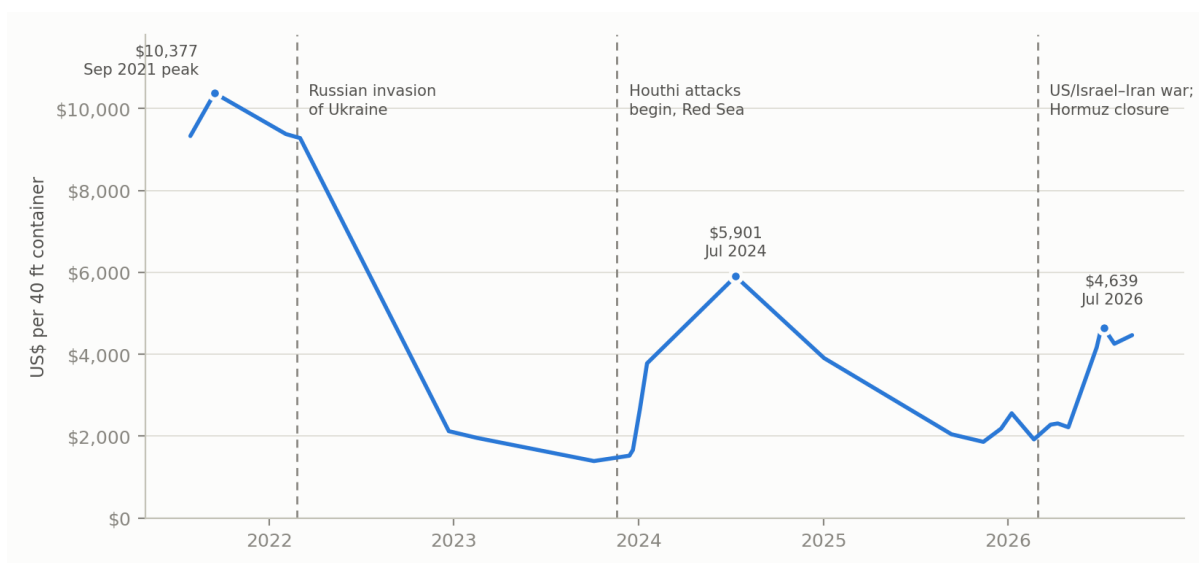


Figure 4. Drewry World Container Index, composite spot rate, 2021–2026. Compiled from Drewry weekly assessments as reported by AJOT, Hellenic Shipping News, FreshPlaza, Container News and Drewry. The September 2021 value is Drewry's stated pandemic peak.

Figure 4 shows the composite Drewry World Container Index at USD 9,376.70 on 3 February 2022 and USD 9,279.46 on 3 March 2022, the first full week after the invasion — a decline of approximately 1%. The index was near its all-time high for pandemic-

related reasons and drifted downward through the invasion without inflection. Any account of the Ukraine war that shows a February 2022 container rate spike is describing something that did not occur.

On the other hand, the Red Sea crisis produced the most clear-cut event signature in the entire dataset. On 14 December 2023 the index stood at USD 1,521, rose by 9% to USD 1,661 on 21 December, increased by 61% to USD 2,670 on 4 January 2024 and on 18 January had climbed to USD 3,777 – thus showing a total increase of 148% over the five-week period. The route figures show that the effect was felt in the correct areas: over those five weeks the Shanghai-Rotterdam route rose by 243% and the Shanghai-Genoa route increased by 270%, whereas the Shanghai-Los Angeles route went up by 94% and the Shanghai-New York route by 98%. In the one-week period ending 3 January 2024 the Freightos Baltic Index recorded a weekly rise of 151% for the Asia-North Europe route and 108% for the Asia-Mediterranean route. The market responded by adjusting the prices of the routes which had to go around Africa, but made only small changes to the prices of the Pacific routes.

The Israel-Iran confrontation in June 2025 had not the slightest effect on the container indices. The Hormuz war in 2026 did have an impact, although with a delay and with an added complication. The index was at USD 1,919 on 21 February 2026, right before the hostilities began, rose to USD 2,279 by 26 March, and then dropped back to USD 2,216 by 30 April as the so-called "Iran conflict premium" declined (gCaptain, 2026b). A much bigger increase occurred later, rising to USD 4,639 on 9 July 2026, which represented a 142% increase compared to the level before the war. However, this rise took place at an unusually early peak season with bunker costs also being considerably higher, so it cannot be blamed entirely on the conflict. The fair interpretation is that the war helped cause the rate surge even if it did not cause it entirely.

The Tanker Market

The container market barely noticed the war in Ukraine, but the tanker market responded to it right away and in a violent manner. According to data from the EIA, the rates for dirty Aframax tankers on Black Sea routes rose from \$10.11 to \$32.10 per tonne between January and April 2022, an increase of 217 per cent, and rose from \$7.50 to \$41.38 per tonne on Baltic routes, a rise of 452 per cent; meanwhile, the rates for clean product tankers on the Baltic-UK Continent routes doubled between February and May 2022.

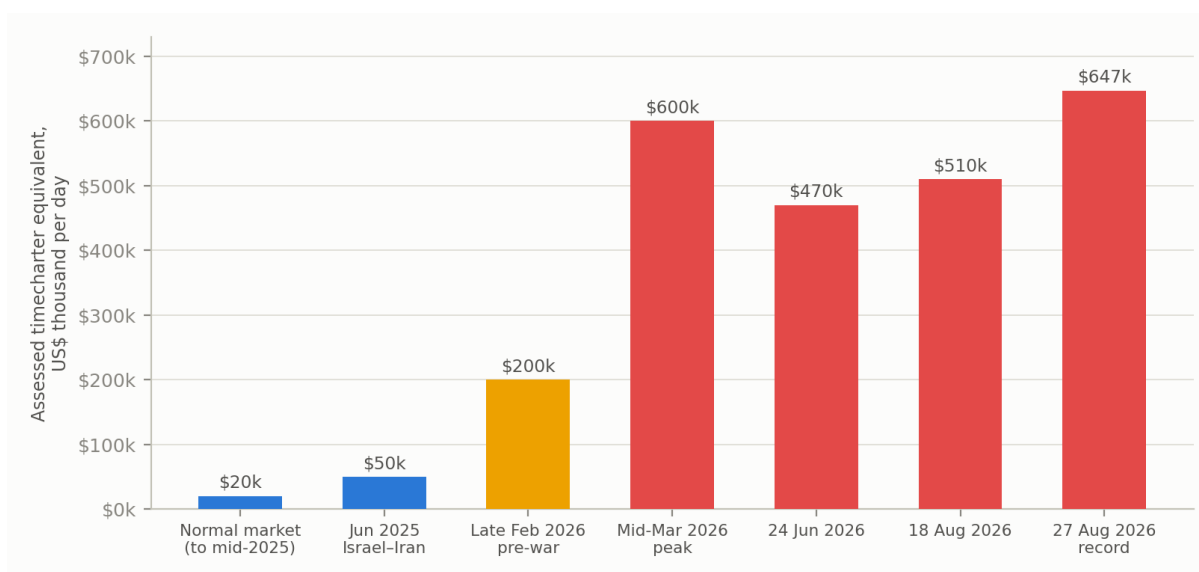


Figure 5. VLCC assessed earnings, Middle East Gulf to Asia, 2025-2026. Compiled from MEES (2026), Seatrade Maritime (2026), Signal Group (2026) and Bloomberg reporting via OilPrice (2026a, 2026b). Values are assessed benchmark levels, not realised earnings.

The tanker rates during the 2026 Gulf conflict were unprecedented in the recorded history. When the normal rate for a VLCC voyage from the Middle East Gulf to China was about USD 20,000 per day, the June 2025 incident between Israel and Iran caused a temporary rise to just over USD 50,000. Before the war started, by the end of February 2026, the rates had already reached approximately USD 200,000 per day as a result of anticipatory risk pricing, which itself was a six-year high. In mid-March 2026 the TD3C benchmark temporarily surpassed Worldscale 600, equivalent to more than USD 600,000 per day, a figure that the EIA

(2026b) states is the highest ever since its series began in November 2005. The assessed rates reached USD 470,000 on 24 June, USD 510,000 on 18 August and USD 647,000 on 27 August 2026, which was about ten times the level a year earlier.

The figures in dollars per tonne are just as clear: the average over a five-year period on the Gulf-China route was USD 18.91 per tonne, whereas in March 2026 the figure had reached about USD 140 and by the end of July had dropped to USD 77.96; it therefore follows that the cost of transporting a single consignment of 270,000 tonnes is approximately USD 21 million (Al Jazeera, 2026c).

The caveat mentioned in Section 3.4 likewise applies in this case. According to Seatrade Maritime (2026), the figures for March 2026 showed an absence of bona fide market activity, had inflated war-risk premiums, and contained contracts which were either not repeatable or later proved to be unsuccessful; consequently, a large part of the quoted freight rates could be seen as being based on risk pricing rather than on transport economics. Prices stop being a reliable indicator of activity when volumes fall.

War-Risk Insurance

Insurance is the method by which risk stops being a matter of judgement and instead becomes a binding operational constraint, since having war risk insurance is a necessity if one is to trade, to comply with a charterparty and to obtain financing.

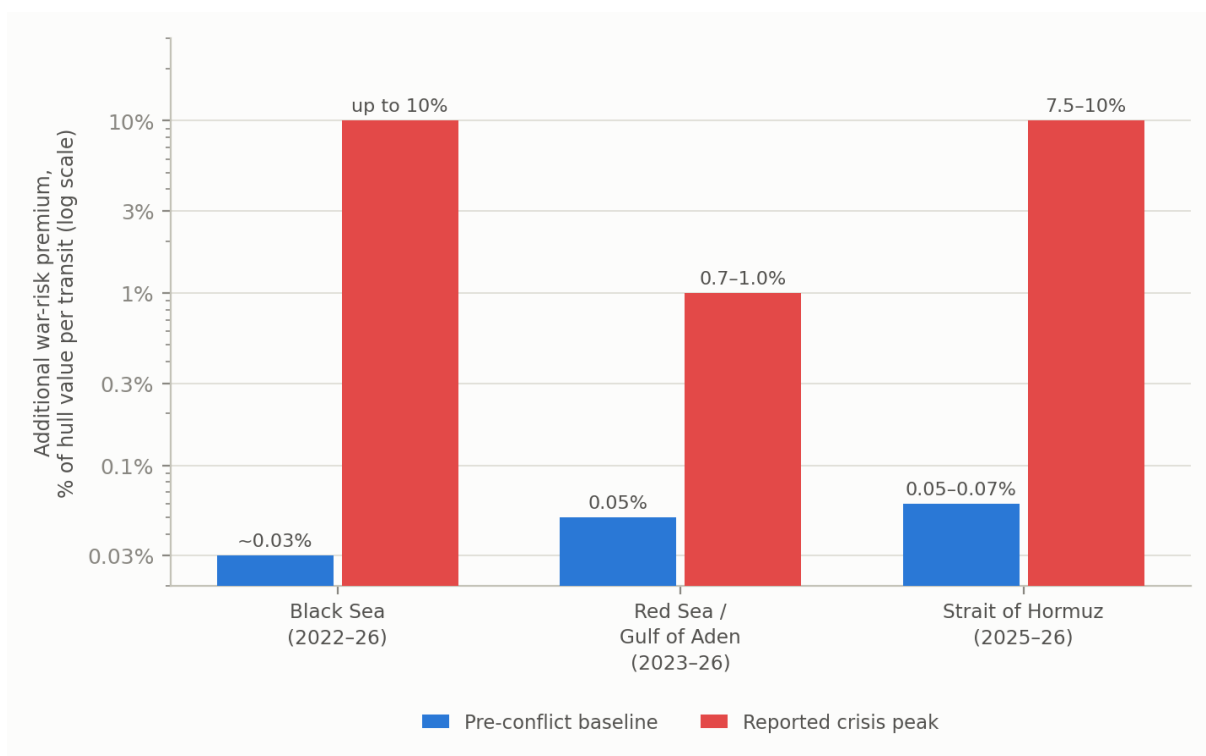


Figure 6. Marine war-risk premiums, pre-conflict baseline against reported crisis peak. Note the logarithmic vertical scale. Sources: S&P Global Commodity Insights (2026); Reuters; Marsh; and Bloomberg reporting for the April 2022 Black Sea peak.

The Black Sea premium increased from a level which was regarded as almost zero prior to February 2022 to a peak in April 2022 when the quotations reached as high as 10% of hull value, the point at which a tanker worth USD 50 million would have to pay a premium of USD 5 million—more than the amount it earned from hiring the vessel. The rates settled at 1.0 to 1.2% per voyage for shipments to Ukrainian deep-water ports through to 2023, dropped to 0.25 to 0.30% by mid-November 2025, jumped by 250% in early December 2025, and rose above 1% once again in July 2026.

The premium for the Red Sea increased from a nominal 0.05%, with a large number of underwriters choosing completely to drop war coverage, to 0.2% on 13 December 2023 and reached 0.7 to 1.0% by early February 2024, when a vessel worth USD 120 million had to pay more than USD 1.2 million extra for each transit. It then dropped back to 0.2% by early December 2025 after the October ceasefire, before rising to about 0.75% on 21 July 2026 following the imposition of a blockade on Saudi Arabia, and

exceeding 1% by 23 July, with a rate of 3% being quoted for vessels linked to Saudi Arabia calling at ports in the southern Red Sea.

The Hormuz premium shows the sharpest movement in the dataset. Against a baseline of 0.05–0.07% of hull value for a seven-day transit, rates reached 0.2% on 13 June 2025, 1–3% by early July 2026, and 7.5–10% of hull value by 22 July 2026 (Marsh, cited in S&P Global, 2026). On a USD 100 million tanker that is USD 7.5–10 million per voyage against approximately USD 250,000 before the war, an increase of thirty- to fortyfold.

Two features of the insurance market accounted for these changes. Firstly, the total global hull war capacity amounts to only USD 2.5 to 3 billion and since the underwriters were unwilling to provide spot cover, the limitation wasn't just one of price but also of quantity. Secondly, and more significantly, on 2 to 5 March 2026 the main protection and indemnity clubs—Skuld, Gard, North Standard, the London P&I Club and the American Club—cancelled their war-risk insurance for the area with just 72 hours' notice, Skuld giving the reason that the reinsurers had withdrawn their capacity at short notice (Maritime Executive, 2026). As a result, tanker traffic dropped to effectively zero. This represents the kind of discontinuity that was predicted by the conceptual framework in Section 3.3: the binding constraint was not the price of the risk but the availability of cover.

The circulars issued by the Joint War Committee show the statutory limits applicable to these events. The waters of the Black Sea and the Sea of Azov belonging to Ukraine and Russia were included on 15 February 2022, eight days prior to the invasion. The boundaries of the Indian Ocean, the Gulf of Aden and the southern Red Sea were altered in December 2023. On 3 March 2026 Bahrain, Djibouti, Kuwait, Oman and Qatar were added, together with Saudi Arabia on 29 July 2026.

Table 2. Additional war-risk premium as a percentage of hull value, by theatre

Theatre	Period	Premium (% hull value)	Illustrative cost
Black Sea	Before Feb 2022	Near zero	Cover frequently waived
Black Sea	April 2022 peak	Up to 10%	~\$5m on a \$50m tanker
Black Sea	2023, Ukrainian deep-water ports	1.0–1.2% per voyage	—
Black Sea	Mid-Nov 2025	0.25–0.30%	—
Black Sea	July 2026	Above 1%	—
Red Sea / Gulf of Aden	Before Oct 2023	~0.05%	Often waived entirely
Red Sea / Gulf of Aden	13 Dec 2023	0.2%	~\$100k, average Aframax
Red Sea / Gulf of Aden	Early Feb 2024	0.7–1.0%	>\$1.2m on a \$120m vessel
Red Sea / Gulf of Aden	Early Dec 2025	0.2%	Post-ceasefire
Red Sea / Gulf of Aden	23 July 2026	Above 1%; 3% Saudi-linked	—
Strait of Hormuz	Baseline to June 2025	0.05–0.07% per 7-day transit	~\$250k on a \$100m tanker
Strait of Hormuz	13 June 2025	0.2%	Insurance \$0.25→\$0.70–0.80/bbl
Strait of Hormuz	Early July 2026	1–3%	—
Strait of Hormuz	22 July 2026	7.5–10%	\$7.5–10m per voyage

The Human Cost

Fatalities and Incidents

The most authoritative figure on casualties in this study is that of the IMO: by 11 August 2026 there had been 65 confirmed incidents and 17 confirmed deaths among seafarers in the Strait of Hormuz and in the wider Middle East area, the conflict at that time having lasted about five and a half months.

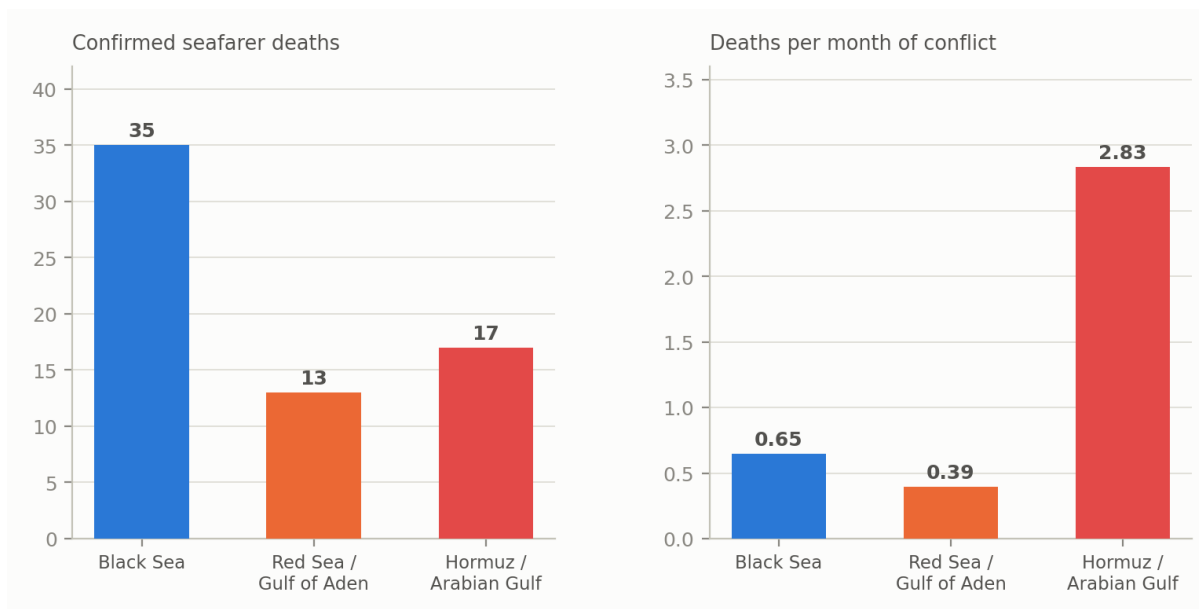


Figure 7. Seafarer fatalities by theatre, absolute count and intensity. Black Sea figures are verified minima constructed from individually named incidents, not totals. Sources: IMO (2026) for the Gulf; compiled incident reporting for the Black Sea and Red Sea.

Figure 7 presents the comparison that motivates the intensity normalisation described in Section 3.1. In absolute terms the Black Sea has the highest confirmed toll at approximately 35 deaths, against 13 in the Red Sea and Gulf of Aden and 17 in the Gulf. But normalised by duration the ranking inverts sharply: 0.65 deaths per month in the Black Sea, 0.39 in the Red Sea, and 2.83 per month in the Gulf. The 2026 Gulf theatre is between four and seven times more lethal per unit time than either predecessor.

For the Red Sea, US MARAD records more than 100 separate Houthi attacks on commercial vessels between November 2023 and October 2025, affecting more than 60 nations. Six merchant vessels were sunk by name – Rubymar (March 2024), Tutor (June 2024), Magic Seas and Eternity C (both July 2025), Faize Noore Oliya (August 2026) and Tihamah (August 2026) – and two seized, the Galaxy Leader in November 2023 and the MSC Aries in April 2024.

The detention figures deserve separate emphasis, because they represent a harm distinct from death or injury. The 25 crew of the Galaxy Leader were held for 430 days. Eleven survivors of the Eternity C were detained from July until 3 December 2025. The IMO separately appealed in 2026 for the release of 44 seafarers held by Somali pirates, a resurgence causally connected to the diversion of naval counter-piracy assets to Red Sea escort duty.

For the Gulf, the scale of the trapped population is the distinguishing feature. UN News (2026a) reported approximately 6,000 crew and 500 vessels still trapped in August 2026, with 2,900 evacuated to that point; the IMO put the total regional exposure at around 20,000 seafarers, plus port workers and offshore crews, against approximately 2,000 vessels at the conflict's outset.

The Nationality Distribution

The seaman nationality data shows the mechanism by which vessel attacks become a labour-supply shock.

Table 3. Reported seafarer casualties by nationality and theatre

Nationality	Black Sea	Red Sea / Gulf of Aden	Hormuz / Arabian Gulf	Principal incidents
Filipino	Injured (Namura Queen, Kmax Ruler)	5 killed	3 killed, 1 missing, 10 injured	True Confidence, Tutor, Eternity C, Sidr
Indian	Injured (Optima); killed (Golden Leo)	Detained (Eternity C)	4+ killed	Settebello, Safesea Vishnu, Mombasa B
Syrian	3 killed (MJ Pinar); killed (Golden Leo)	—	—	MJ Pinar, Golden Leo
Ukrainian	Pilots and crew killed; 10+ (Shui Spirit)	Detained (Galaxy Leader)	—	Kmax Ruler, Shui Spirit, Golden Leo
Bangladeshi	1 killed	—	—	Banglar Samriddhi
Vietnamese	—	1 killed	—	True Confidence
Pakistani	—	3 killed	—	Tihamah
Indonesian	—	1 killed	—	Tihamah
Russian	2 injured (Millennial Spirit)	Detained (Eternity C)	—	Millennial Spirit, Eternity C
Bulgarian	—	Detained (Galaxy Leader)	—	Galaxy Leader

The pattern exhibited in Table 3 is seen in all three theatres. The crews on the vessels which are attacked are mainly from a small number of developing countries, specifically the Philippines, India, Bangladesh, Syria, Vietnam, Indonesia and Ukraine, while the vessels themselves are mostly registered in open registries, namely Liberia, Panama, the Marshall Islands, Malta, Barbados and Belize—and are beneficially owned in Greece, Japan, the United Kingdom and Turkey. The risk is shouldered by one group of nationalities while the asset is held by another.

The only comprehensive national dataset is provided by the Philippine Department of Migrant Workers. By September 2026, 31 ships carrying 421 Filipino seafarers had been the target of attacks since the hostilities started on 28 February 2026; in this situation 406 of the seafarers were unharmed, 10 had been injured but had since recovered, three had died and one was missing, and about 268 had already been repatriated.

Seafarer Supply Concentration

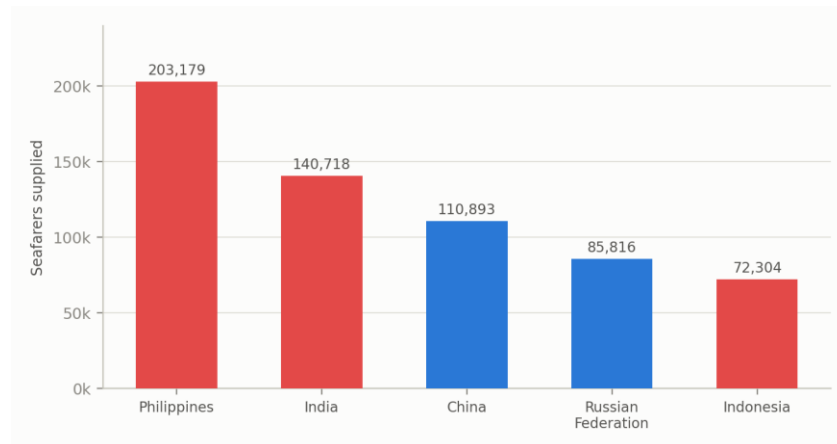


Figure 8. The five largest seafarer-supplying states, 2026. Source: BIMCO/ICS Seafarer Workforce Report 2026

The Seafarer Workforce Report 2026 issued by BIMCO and ICS shows that the total global supply of seafarers is 2,565,580, whereas the demand is 2,547,790, representing a shortage of 39,100 certified officers and an excess of 56,890 ratings. The five countries that provide the largest number of seafarers – the Philippines (203,179), India (140,718), China (110,893), the Russian Federation (85,816) and Indonesia (72,304) – make up 56.25% of the global supply.

Two aspects of this distribution are relevant to the argument. Firstly, the concentration implies that a decision on policy taken by one or two governments could have a substantial effect on global crew availability. Secondly, the two biggest suppliers are exactly the two states whose citizens suffered confirmed deaths in the Gulf theatre in 2026.

It must be made clear that the Workforce Report itself attributes the shortage of officers to problems relating to recruitment and retention as well as to the recovery in demand following the pandemic, not to armed conflict; the causal link discussed in Section 5.3 of this paper is based on evidence from unions, regulators and the industry, not on the workforce report.

Discussion

Structural Drivers

The following six structural features explain the effects that were observed in these conflicts.

The first and most important factor is the geography of the chokepoints and the availability of substitutes; the three corridors are in different positions on the substitution spectrum and their outcomes therefore follow this order. In the case of the Red Sea there is an expensive alternative and this led to a cost shock with little loss in volume. Since there is no other option than the Bosphorus for the Black Sea, Ukraine was able to partly replace use of the Danube river ports and overland routes and this resulted in a severe but only partial and eventually reversible loss of volume. Hormuz has no alternative at all since the cargo starts off within the strait and this caused a collapse in volume. The bypass pipeline, with a capacity of 3.5 to 5.5 million barrels per day compared to the normal flow of about 20 million barrels per day, could not serve as a substitute for the strait.

Energy trade dependency is the second. All three corridors carry disproportionate energy volumes, which converts a maritime disruption into a macroeconomic one. The Hormuz LNG position is the most acute case, because LNG cannot be redirected at speed: liquefaction and regasification capacity is fixed, contracts are long-term, and Qatar's 93% dependence on the strait has no engineering remedy.

Insurance market structure is the third, and is under-treated in the academic literature. The Section 4.3 finding that the operative constraint at Hormuz was the withdrawal of cover rather than its price is a structural fact about a market with only USD 2.5–3 billion of global hull war capacity and a reinsurance layer that can be withdrawn at 72 hours' notice.

Flag-of-convenience as well as shadow fleet dynamics constitute the fourth. The nationality mismatch documented in Section 4.4.2 is a structural feature, not an accident: open registry and third-country crewing distribute risk away from the beneficial

owner and toward the labour-supplying state, which weakens the incentive to avoid risk and diffuses the political consequences of casualties across many capitals rather than concentrating them in one.

Carrier and capacity concentration is the fifth. A small number of alliances control most container capacity, and their simultaneous decisions to divert produce a step change rather than a gradual reallocation. Naval escort dependence is the sixth, and it interacts with the fifth: escort capacity is finite, and the diversion of counter-piracy assets to Red Sea escort duty contributed to the resurgence of Somali piracy that produced the 44 hostages noted above. Security is not created by escort; it is moved..

The Two Conflicts Are Not the Same Shock

The comparative finding of this study is that the Russo-Ukraine war and the US/Israel-Iran conflict transmit through different channels, at different speeds, with different persistence, and that policy responses calibrated to one will misfire against the other.

The Ukraine war was a commodity and tanker event. It moved dirty tanker rates by 217–452%, moved food prices sharply – the FAO Food Price Index reached an all-time high of 159.3 points in March 2022, up 12.6% in a single month, with wheat up 19.7% – and moved European gas prices to above EUR 300 per megawatt hour in August 2022. It did not move container freight. Its network effect, on Cong et al.'s (2024) measurement, was to increase rather than decrease worldwide connectivity, as the system reconfigured around a peripheral node.

The Red Sea crisis was a container and routing event. It moved container rates by 148% on the composite and 243–270% on the directly affected lanes, added 8,500 nautical miles and roughly twenty days to the Asia-Europe round trip, raised emissions per voyage in figures ranging from 31% to over 70% depending on route and speed assumptions, and reduced effective global container capacity by 9%. Its oil price effect was limited, a finding confirmed by Bayesian VAR analysis (CEPR, 2024) and consistent with the fact that oil could still reach market by an alternative route.

The Hormuz closure was a situation involving a large reduction in volume. It did not redirect trade; it halted it. Its main features were a drop of 90 to 95 per cent in the number of shipments, a 47 per cent decrease in exports of crude oil from the Gulf, the imposition of force majeure on Qatari LNG, and price figures that became unreliable because the volumes had disappeared. In April, the IMF reduced its predicted global growth for 2026 to 3.1 per cent and then lowered it further to 3.0 per cent in July, at the same time raising the global inflation figure by 0.6 percentage points to 4.4 per cent, with Iran's economy contracting by 6.1 per cent and the MENA region's forecast being reduced by 2.8 per cent.

The interaction between the conflicts is the finding that a single-conflict study structurally cannot produce. The Suez recovery of 2026 was caused by the Gulf war, not by any improvement in Red Sea security. Cargo displaced from one closed corridor returned to a corridor it had abandoned two years earlier because it was dangerous, which it remained. This is a system reallocating across a menu of bad options rather than returning to normality, and it means that recovery indicators at any single chokepoint can be actively misleading as measures of system health.

The Seafarer Labour Constraint

The point made in this section is that in 2026 seafarer availability acted as a separate limitation on chokepoint throughput and was more binding than the physical capacity.

The process consists of four stages: attacks cause the casualties to be concentrated among seafarers from only a few of the states that supply labour. These states then react by adopting certain policies. At the same time, the contractual and market mechanisms give individual seafarers with both the right and a financial motivation to refuse. The outcome is that the effective supply of crew for the affected route contracts exactly when rerouting is raising the demand for crew-hours in other areas.

The evidence for step two is clear. India's Directorate General of Maritime Administration – the renamed Directorate General of Shipping, reconstituted under the Merchant Shipping Act, 2025 – acted twice. In mid-June 2026 it instructed recruitment and placement licence holders and shipping operators to restrict deployment of Indian seafarers in the Strait of Hormuz and Gulf of Oman, permitting crew changes in emergencies with crew consent; that instruction was revoked on 26 June after approximately thirteen days. Then in mid-July 2026, following the deaths of Indian nationals aboard the Mombasa B and Safesea Vishnu and the earlier deaths of three Indian seafarers aboard the Settebello, it issued an advisory directing ship owners, managers and licence holders to avoid deploying Indian seafarers on vessels transiting the Strait of Hormuz until further orders.

Here are two points worth noting. The instrument is an advisory based on directive language and not a statutory ban; industry sources stressed that the word "avoid" was the key one. Also, it refers specifically to the Strait of Hormuz and not to the Persian Gulf as a whole. Yet, an instruction of this kind coming from the regulator of the world's second-largest crewing country, which involves 140,718 seafarers, amounts to a considerable intervention in the global crew supply.

The Philippines, as the largest contributor with 203,179 seafarers, adopted a different approach according to the situation. By means of Department Order No. 21, Series of 2025, issued on 18 July 2025, manning agencies were strictly forbidden from assigning Filipino seafarers to ships that had previously been attacked or that were transiting areas identified as risk-prone by the ITF-IBF in the southern Red Sea and the Gulf of Aden, the prohibition applying irrespective of whether the incident in question was past, current or foreseeable. However, in September 2026 the Department of Migrant Workers clearly refused to impose a complete ban on the Strait of Hormuz, instead requiring shipowners to meet safety conditions and retaining the individual seafarer's right to refuse, while at the same time retaining the national red alert.

It is helpful in a conceptual sense. The two largest crewing countries adopted different instruments—a strict ban on the Red Sea from Manila, an advisory directive on Hormuz from New Delhi—and neither of them took the other's approach when it came to the other's area. Since there is no collective international mechanism which regulates the deployment of seafarers to war zones, the resulting fragmented system means that the effective crew supply for any particular corridor depends on which flag states and which crewing nationalities are involved.

The evidence for step three is equally direct. On 5 March 2026 the ITF and the Joint Negotiating Group jointly designated the Strait of Hormuz, Gulf of Oman and Persian Gulf a Warlike Operations Area, which under International Bargaining Forum terms confers a bonus equal to 100% of basic wage for a minimum of five days and each additional day in the area, doubles death and disability compensation, and gives seafarers ordered to enter the right to refuse to sail and to repatriation at the company's expense. The Red Sea had been so designated in April 2024, extending those rights to approximately 360,000 seafarers.

Market bonuses went well above the contractual minimum. Sinokor provided an extra six months' salary for a single round-trip journey from Hormuz lasting about one month; other companies added up to 60 days' salary to contracts of 30 days; and the Indian maritime authorities stated that unlicensed operators were offering three to four times the normal wages. The result in terms of distribution is the most ethical conclusion that can be drawn from this material, and it is exactly as the industry press put it: a senior master who earns perhaps USD 15,000 a month might regard a large bonus as payment for a professional risk which he has assessed and accepted, while a junior rating earning close to USD 1,500 would see the same bonus as an amount capable of altering the financial situation of an entire family. In law, both parties give their consent. In reality, however, the risk is being shifted down the wage scale.

The evidence for step four – an actual supply effect – is the weakest link in the chain and should be characterised honestly. ITF General Secretary Stephen Cotton warned in mid-2026 of a potential shortage of qualified officers, on the grounds that senior professionals were explicitly refusing contracts on high-risk-area vessels and, having already endured pandemic-era lockdowns, were concluding that the career was no longer worth it. Crewing firms reported a distinct polarisation in which experienced seafarers demanded safety guarantees whereas less experienced applicants prioritised employment over safety. Owners reported considerable numbers of crew leaving vessels, while also reporting that replacements could still be found.

That point is important and goes against the idea of overemphasising the situation. By September 2026 the restriction had an effect on both price and on the composition of crews—since they are more costly, less experienced, and come from a narrower and more economically vulnerable group—rather than causing a complete inability to crew ships. The stronger assertion that conflict is measurably reducing the total supply of seafarers is not yet backed by the workforce data, which assigns the shortfall of 39,100 officers to other reasons. The reasonable claim is that conflict has become a major additional pressure on retention in an officer market which was already in deficit, and that the countries supplying the majority of the world's seafarers have shown both the willingness and the legal ability to unilaterally limit the deployment of officers. That ability represents a potential constraint on throughput at chokepoints even if it has not yet completely bound the situation.

Economic Impact

Short Term, Zero to Six Months

The immediate impact is through price. Brent crude rose above USD 100 on 24 February 2022 and reached an intraday high of USD 139.13 on 7 March 2022, the highest since 2008. In the 2026 Gulf conflict Brent reached USD 109.40 on 9 March 2026,

having stood at approximately USD 72 in late February, and traded around USD 97 in early September 2026 before topping USD 100 on 9 September.

European gas prices exceeded EUR 300 per megawatt hour in August 2022 against a ten-year pre-crisis range of EUR 5–35. In the 2026 conflict, TTF settled at USD 20.91 per million British thermal units on 22 July 2026, the highest close since January 2023, with Asian JKM at USD 22, following reductions in Qatari and Emirati loadings.

Food prices are the most direct short-term welfare channel. The FAO Food Price Index reached 159.3 points in March 2022, an all-time high, with the cereal index up 17.1% in the month and vegetable oils up 23.2%. Russia and Ukraine together supplied approximately 30% of global wheat exports and 20% of maize. By August 2026 the index had returned to 133.3 points, its highest since March 2022, with grains rising on continued uncertainty over Black Sea export flows and Ukrainian exports running at 30% of target in early August.

Medium Term, Six Months to Two Years

Over the medium term the effects work through inflation, inventory policy and fiscal position.

The inflation channel is quantified by Carrière-Swallow et al. (2023): a doubling of shipping costs adds approximately 0.7 percentage points to headline CPI, peaking at twelve months and persisting to eighteen. Applied to the Red Sea event, in which the composite container index rose 148%, the implied contribution is material though not dominant. The ITF/OECD (2024) estimate that a 100% freight rate increase could raise OECD import price inflation by roughly 5 percentage points and consumer price inflation by 0.4 percentage points after about a year. CEPR (2024) modelling of a protracted Red Sea disruption estimated global trade 1.3 percentage points lower in 2024, global inflation 0.18 percentage points higher, and euro area HICP 0.30 percentage points higher in both 2024 and 2025.

The fiscal channel is most visible in Egypt, where Suez revenue fell from USD 10.25 billion in 2023 to USD 3.99 billion in 2024, a loss of over USD 6 billion against a target of USD 10.6 billion, in an economy with limited fiscal space. The European energy response is the largest single fiscal number in this study: European governments committed approximately EUR 792 billion to shield households and firms as of February 2023, of which Germany solely accounted for roughly EUR 270 billion – a figure comparable to the entire EU pandemic recovery fund.

The inventory channel is the clearest behavioural adaptation. The literature on the period documents a structured shift from just-in-time toward just-in-case inventory positioning, which raises working capital requirements permanently in exchange for reduced disruption exposure.

Long Term, Beyond Two Years

Three long-run effects are identifiable from the evidence available.

The first is the repricing of global risk in freight and insurance markets. The Joint War Committee's listed-area perimeter expanded across the period to encompass most of the western Indian Ocean, the Gulf and the Black Sea. A structurally larger share of world trade now moves through areas that carry a war-risk loading as a permanent feature rather than an episodic one.

The second is network topology. Zhang and Liu's (2026) finding that hub ports suffered only 43% of the throughput loss of non-hub ports implies that repeated disruption will concentrate traffic further into large hubs, strengthening the position of ports with scale and optionality at the expense of smaller regional ports. The evidence on redistribution is more equivocal than expected: increased Cape of Good Hope transits did not translate proportionally into South African port calls, with Transnet reporting that diverted vessels mostly called only for bunkering and crew changes.

The third is energy sourcing and corridor diversification. The Ukraine war permanently redirected Russian crude toward Asia via the Turkish Straits and permanently reoriented European gas procurement toward LNG. The Hormuz closure has made the absence of Gulf bypass capacity a first-order strategic question, and Saudi Arabia's comparatively mild 15% port call decline, attributable to its Red Sea bypass at Yanbu, is the clearest demonstration available of what such infrastructure is worth.

The environmental long run should not be omitted. UNCTAD (2024) calculates that a Singapore-Northern Europe round trip rerouted via the Cape raises greenhouse gas emissions by over 70%, that a 1% speed increase raises fuel consumption 2.2%, and that moving from 14 to 16 knots raises consumption per nautical mile by 31%. Reuters analysis found a Shanghai-Hamburg

container voyage rerouted around Africa emits 38% more carbon dioxide, an additional 4,320 tonnes per voyage. Conflict-driven rerouting directly undermines maritime decarbonisation commitments.

Mitigation Measures and Managerial Implications

Operational Measures

Convoy and escort operations were the primary operational response in all three theatres, and their record is mixed. They restored partial traffic to the Red Sea but did not restore pre-crisis volumes, and the diversion of naval assets to escort duty contributed to a piracy resurgence elsewhere. Escort is a reallocation of finite security capacity, not an addition to it, and should be planned as such.

Rerouting protocols are effective in proportion to the availability of an alternative, which is to say that they were effective in the Red Sea, partially effective in the Black Sea and largely irrelevant at Hormuz. The managerial implication is that contingency planning must be corridor-specific: a generic diversion plan is worthless for a corridor with no diversion.

Real-time risk monitoring using AIS and commercial intelligence is now standard, but the 2026 experience exposes its limits. When 70% of vessels transit with transponders disabled, AIS-based monitoring degrades precisely when it is most needed. Operators relying on it should assume systematic understatement in high-threat conditions and should not treat AIS silence as absence of traffic.

Financial and Insurance Measures

The most instructive intervention in the entire dataset is the Unity Facility, launched in November 2023 by Marsh McLennan with Ascot as lead underwriter and Lloyd's syndicate participation, and expanded on 1 March 2024 from grain to all non-military cargo. It provided up to USD 50 million in hull and separate P&I war-risk cover, structured on standby letters of credit from Ukreximbank and Ukgasbank confirmed by DZ Bank and backed by Ukraine's export credit agency. Reported effects include a reduction of approximately 2.5 percentage points in insurance tariff and savings estimated at UAH 100–140 per tonne of cargo.

The design principle is worth isolating because it is generalisable: a sovereign-backed credit structure was used to unlock private underwriting capacity that would not otherwise have been deployed. This addresses the capacity constraint identified in Section 4.3 rather than merely subsidising price. Where war-risk capacity is the binding constraint, a facility of this design is more effective than premium subsidy, because subsidy does not create capacity.

Hedging and surcharge mechanisms transfer cost but do not reduce it. The carrier surcharge record from the period is extensive – Hapag-Lloyd's USD 1,500 per TEU war risk surcharge of 2 March 2026, rising to USD 3,500 for reefer and special equipment, and CMA CGM's USD 2,000 per TEU and USD 3,000 per FEU – and represents cost pass-through to shippers rather than mitigation.

Strategic and Supply Chain Measures

Diversification of sourcing and routing is the standard prescription and remains correct, subject to one qualification that this study makes explicit: diversification is only available where substitutes exist. For Qatari LNG through Hormuz, there is no route diversification, only demand-side substitution or storage.

Strategic reserves demonstrated their value, and the Gulf conflict has strengthened the case for regional LNG storage in import-dependent economies – particularly Bangladesh, India and Pakistan, which source almost two-thirds of their LNG through the strait.

Bypass infrastructure is the highest-value long-term strategic investment identified in this study. The comparison between Saudi Arabia's 15% port call decline and the 69–86% declines suffered by the UAE, Kuwait, Qatar and Iraq is a direct measurement of what pipeline bypass capacity is worth in a closure scenario.

Seafarer Protection Measures

This category follows from Section 5.3 and is, in the authors' assessment, the most under-developed area of maritime crisis policy.

Four measures are indicated. First, coordination of deployment restrictions: the divergence between Indian and Philippine instruments demonstrates that there is no international mechanism, and the resulting patchwork is inefficient for operators and inequitable for seafarers, since protection depends on nationality rather than on exposure. The IMO is the natural forum.

Second, enforcement of refusal rights. The contractual right to refuse exists under IBF terms, but its exercise depends on the seafarer's economic position. Where a bonus equals six months' salary, the right is formally intact and substantively compromised. Regulatory systems that do not depend on the individual's willingness to forgo transformative sums are required.

Third, treatment of detention as a distinct harm. The 430-day detention of the *Galaxy Leader* crew and the five-month detention of *Eternity C* survivors are not adequately captured by casualty statistics, and the mediation channels that eventually secured both releases were ad hoc.

Fourth, systematic casualty data. The IMO's Gulf figures are the most reliable in this study precisely because a single authority compiled them; the Black Sea figures are the least reliable because no one did. A standing IMO register of seafarer casualties in armed conflict, with nationality breakdown, would materially improve both policy and research.

Managerial Implications

For shipping lines and charterers, three implications follow. Corridor-specific contingency planning should replace generic diversion planning. War-risk capacity, not premium level, should be treated as the operative constraint and secured in advance of need. And crew sourcing should be recognised as a strategic exposure: an operator whose crewing is concentrated in one or two nationalities is exposed to those states' regulatory decisions.

For port authorities, the hub-resilience finding implies that scale and route optionality are themselves resilience assets, and that smaller ports face structurally greater disruption risk. For shippers, the twelve-month peak lag in the shipping-cost-to-inflation relationship means that procurement decisions taken during a rate spike will have impact on costs well after the spike resolves.

Conclusion

This paper set out to determine how two concurrent conflicts transmitted stress through maritime chokepoints into global supply chains, and at what cost.

The principal finding is that the two conflicts are not comparable shocks and should not be modelled as such. The Russo-Ukraine war was a commodity and tanker event that moved Black Sea and Baltic tanker rates by 217–452% and drove food and energy prices to record levels, while leaving container freight entirely unmoved and, on network measures, leaving global maritime connectivity higher than before. The Red Sea crisis was a routing event that preserved volume at substantially higher cost, adding 8,500 nautical miles and twenty days to the Asia-Europe round trip, raising container rates 148% on the composite and up to 270% on affected lanes, and lowering effective global container capacity by 9%. The 2026 Strait of Hormuz closure was a volume event that stopped trade rather than rerouting it, cutting transits by 90–95% from a baseline of 144 per day, cutting Gulf crude exports 47%, and driving war-risk premiums from 0.05–0.07% to 7.5–10% of hull value.

The second finding is that the conflicts interacted, and that this interaction is invisible to single-conflict analysis. The 2026 recovery in Suez traffic and revenue was caused not by improved Red Sea security but by the closure of Hormuz displacing cargo back onto a route it had abandoned. Chokepoint-level recovery indicators can therefore be actively misleading as measures of system health.

The third finding, and the paper's principal original contribution, concerns the human cost. Sixty-five confirmed incidents and seventeen confirmed seafarer fatalities in six months made the 2026 Gulf theatre between four and seven times more lethal per unit time than either predecessor conflict. Because crews are drawn disproportionately from a small number of developing states – the top five supply 56.25% of the global workforce – these casualties concentrated in a handful of labour-supplying countries and produced state-level policy responses, including India's direction to avoid deploying its seafarers through the Strait. Combined with contractual refusal rights and danger bonuses reaching six months' salary for a single transit, this constitutes a labour-supply channel that operates independently of physical capacity. As of September 2026 that channel binds on price and crew composition rather than absolutely, but the demonstrated willingness of major crewing states to restrict deployment unilaterally makes it a latent constraint on chokepoint throughput.

Limitations

The 2026 conflict was unresolved at the time of writing, and no official statistical series covers it; figures for that theatre are provisional. AIS-derived transit counts for the Gulf are understated by an unknown margin because of widespread transponder disabling. Tanker rate assessments for March 2026 reflect risk pricing on thin volumes rather than realised earnings. Black Sea casualty data is contested and is presented as verified minima rather than totals. The attribution of container rate increases in mid-2026 between conflict, peak season and bunker costs cannot be resolved with the data available. The claim that conflict is reducing aggregate seafarer supply rests on union, regulator, and industry evidence rather than workforce statistics, which attributethe officer shortfall to other causes.

Future Research

Four directions follow. First, once complete data are available, a formal difference-in-differences analysis of the Hormuz closure, following Zhang and Liu (2026), should be undertaken, with an explicit correction for AIS degradation. Second, the labour channel should be tested econometrically: whether deployment restrictions imposed by supplying states measurably affect corridor throughput is an empirical question this paper poses but cannot answer. Third, the interaction effect between concurrent chokepoint disruptions warrants formal network modelling, since the Suez-Hormuz substitution documented here suggests that chokepoints are substitutes in ways that single-corridor resilience metrics do not capture. Fourth, the distributional ethics of danger pay – specifically, whether consent to extreme risk is meaningful when the bonus is transformative relative to the seafarer's ordinary earnings – warrants dedicated treatment in the maritime labour literature.

References

1. Al Jazeera. (2026a, September 3). How much oil is going through Hormuz? How data doesn't match US claims. <https://www.aljazeera.com/news/2026/9/3/how-much-oil-is-going-through-hormuz-how-data-doesnt-match-us-claims>
2. Al Jazeera. (2026b, August 27). How a 95 percent drop in Hormuz traffic changed global shipping. <https://www.aljazeera.com/news/2026/8/27/how-a-95-percent-drop-in-hormuz-traffic-changed-global-shipping>
3. Al Jazeera. (2026c, July 23). How shipping insurance rates are rising as Hormuz, Bab al-Mandeb shut down. <https://www.aljazeera.com/economy/2026/7/23/how-shipping-insurance-rates-are-rising-as-hormuz-bab-al-mandeb-shut-down>
4. Allianz Commercial. (2022). Impact of the Ukraine war on global shipping. Safety and Shipping Review. <https://commercial.allianz.com/news-and-insights/expert-risk-articles/shipping-safety-22-ukraine-war.html>
5. BIMCO & International Chamber of Shipping. (2026). Seafarer workforce report 2026: Executive summary. International Chamber of Shipping. <https://www.ics-shipping.org/wp-content/uploads/2026/06/Seafarer-Workforce-Report-2026-Executive-Summary.pdf>
6. Carrière-Swallow, Y., Deb, P., Furceri, D., Jiménez, D., & Ostry, J. D. (2023). Shipping costs and inflation. Journal of International Money and Finance, 130, 102771. <https://doi.org/10.1016/j.jimonfin.2022.102771>
7. Centre for Economic Policy Research. (2024). Sailing through storms: The fallout of Red Sea disruptions on global trade and inflation. VoxEU. <https://cepr.org/voxeu/columns/sailing-through-storms-fallout-red-sea-disruptions-global-trade-and-inflation>
8. Cong, L., Zhang, H., Wang, P., Chu, C., & Wang, J. (2024). Impact of the Russia-Ukraine conflict on global marine network based on massive vessel trajectories. Remote Sensing, 16(8), 1329. <https://doi.org/10.3390/rs16081329>
9. Council of the European Union. (2023). A market mechanism to limit excessive gas price spikes. <https://www.consilium.europa.eu/en/infographics/a-market-mechanism-to-limit-excessive-gas-price-spikes/>
10. Egypt Today. (2025). Suez Canal revenues down 61% to \$3.9 billion in 2024. <https://www.egypttoday.com/Article/3/139635/>

11. Euronews. (2025, April 17). Egypt's Suez Canal revenue fell sharply in 2024 on regional tensions. <https://www.euronews.com/business/2025/04/17/egypts-suez-canal-revenue-fell-sharply-in-2024-on-regional-tensions>
12. European Parliamentary Research Service. (2022). Russia's war on Ukraine: Maritime logistics and connectivity (PE 733.603). European Parliament. [https://www.europarl.europa.eu/RegData/etudes/ATAG/2022/733603/EPRS_ATA\(2022\)733603_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/ATAG/2022/733603/EPRS_ATA(2022)733603_EN.pdf)
13. Food and Agriculture Organization of the United Nations. (2022, April 8). FAO Food Price Index posts significant leap in March. <https://www.fao.org/newsroom/detail/fao-food-price-index-posts-significant-leap-in-march/en>
14. Food and Agriculture Organization of the United Nations. (2023, August 4). FAO Food Price Index rebounds in July. <https://www.fao.org/newsroom/detail/fao-food-price-index-rebounds-in-july/en>
15. Freightos. (2026). Weekly freight updates, March-August 2026. <https://www.freightos.com/freight-industry-updates/>
16. gCaptain. (2026a). Suez Canal revival gathers pace as Hormuz crisis reroutes ships. <https://gcaptain.com/suez-canal-revival-gathers-pace-as-hormuz-crisis-reroutes-ships/>
17. gCaptain. (2026b, April 24). Iran conflict premium fades from Asia-Europe box rates. <https://gcaptain.com/iran-conflict-premium-fades-from-asia-europe-box-rates/>
18. gCaptain. (2026c). Ukraine says Russia hit 52 civilian ships in six weeks as Black Sea attacks escalate. <https://gcaptain.com/ukraine-says-russia-hit-52-civilian-ships-in-six-weeks-as-black-sea-attacks-escalate/>
19. Hapag-Lloyd. (2026, March 2). Shipping from Upper Gulf, Arabian Gulf and Persian Gulf: War risk surcharge. <https://www.hapag-lloyd.com/en/services-information/news/2026/03/shipping-from-upper-gulf--arabian-gulf--and-persian-gulf--a-war-.html>
20. Human Rights Watch. (2025, July 23). Yemen: Houthis' attacks on cargo ships apparent war crimes. <https://www.hrw.org/news/2025/07/23/yemen-houthis-attacks-on-cargo-ships-apparent-war-crimes>
21. International Chamber of Shipping. (2022, February 24). Russian and Ukrainian seafarers make up 14.5% of global shipping workforce. <https://www.ics-shipping.org/press-release/russian-and-ukrainian-seafarers-make-up-14-5-of-global-shipping-workforce-according-to-ics/>
22. International Energy Agency. (2026). Strait of Hormuz. <https://www.iea.org/about/oil-security-and-emergency-response/strait-of-hormuz>
23. International Maritime Organization. (2026). Middle East and Strait of Hormuz. <https://www.imo.org/en/mediacentre/hottopics/pages/middle-east-strait-of-hormuz.aspx>
24. International Monetary Fund. (2026a, April 14). War darkens global economic outlook and reshapes policy priorities. IMF Blog. <https://www.imf.org/en/blogs/articles/2026/04/14/war-darkens-global-economic-outlook-and-reshapes-policy-priorities>
25. International Monetary Fund. (2026b). World economic outlook update, July 2026.
26. International Transport Forum & Organisation for Economic Co-operation and Development. (2024). The Red Sea crisis: Impacts on global shipping. OECD Publishing. <https://www.itf-oecd.org/sites/default/files/repositories/red-sea-crisis-impacts-global-shipping.pdf>
27. International Transport Workers' Federation. (2024). Rage in the Red Sea. <https://www.itfglobal.org/en/news/rage-in-red-sea>
28. International Transport Workers' Federation & Joint Negotiating Group. (2026, March 5). Joint ITF-JNG statement on designation of a warlike operations area: Strait of Hormuz. <https://www.itfseafarers.org/en/news/joint-itf-jng-statement-designation-warlike-operations-area-strait-hormuz>

29. Ke, R., Wang, X., & Peng, P. (2025). Analysis of the impact of the Russia-Ukraine conflict on global liquefied natural gas shipping network. *Journal of Marine Science and Engineering*, 13(1), 53. <https://doi.org/10.3390/jmse13010053>
30. Lloyd's List Intelligence. (2026a, July 21). Strait of Hormuz brief. <https://www.lloydslistintelligence.com/resources/blog/strait-of-hormuz-brief-21-july-2026>
31. Lloyd's List Intelligence. (2026b, September 3). Red Sea brief. <https://www.lloydslistintelligence.com/resources/blog/red-sea-brief-3-september-2026>
32. Lloyd's Market Association. (2026). Joint War Committee listed areas circulars JWLA-033 and JWLA-034. <https://lmalloyds.com/>
33. Maritime Executive. (2026, March 2). P&I clubs cancel war risk cover for the Gulf region.
34. Marsh McLennan. (2024, March 1). Unity insurance facility expanded to cover all shipping to and from Ukrainian ports. <https://www.marsh.com/en/corp/about/news/unity-insurance-facility-expanded-to-cover-all-shipping-to-and-from-Ukrainian-ports.html>
35. Middle East Economic Survey. (2026, February 27). Middle East crude shipping costs surge to six-year highs. <https://www.mees.com/>
36. Ministry for Development of Communities and Territories of Ukraine. (2026). 120 million tonnes of cargo transported via the Ukrainian sea corridor. <https://mininfra.gov.ua/en/news/ukrainskym-morskym-korydorom-perevezeno-120-mln-tonn-vantazhiu>
37. Sarwar, D., & Rye, S. (2025). The impact of the Russia-Ukraine war on global supply chains: A systematic literature review. *Frontiers in Sustainable Food Systems*, 9, 1648918. <https://doi.org/10.3389/fsufs.2025.1648918>
38. Seatrade Maritime. (2026). March VLCC outlook: Historic shockwaves through the market. <https://www.seatrade-maritime.com/tankers/march-vlcc-outlook-historic-shockwaves-through-the-market>
39. S&P Global Commodity Insights. (2026, July 22). War risk premiums for Gulf transits reach 7.5-10% of hull value. <https://www.spglobal.com/>
40. Suez Canal Authority. (2026). Annual navigation report 2025. <https://www.suezcanal.gov.eg/English/Downloads/DownloadsDocLibrary/Navigation%20Reports/Annual%20Reports/2025.pdf>
41. Ukrainian Sea Ports Authority. (2026). Ukrainian seaports fulfilled more than 95% of cargo handling targets in 2025. <https://www.uspa.gov.ua/en/news-en/ukrainian-seaports-fulfilled-more-than-95-of-cargo-handling-targets-in-2025-despite-unprecedented-security-pressure>
42. United Nations. (2023). Black Sea Grain Initiative: What was achieved? <https://www.un.org/en/black-sea-grain-initiative/achievements>
43. United Nations Conference on Trade and Development. (2024). Navigating troubled waters: Impact to global trade of disruption of shipping routes in the Red Sea, Black Sea and Panama Canal. https://unctad.org/system/files/official-document/osginf2024d2_en.pdf
44. United Nations Conference on Trade and Development. (2025). Review of maritime transport 2025, chapter 2. https://unctad.org/system/files/official-document/rmt2025ch2_en.pdf
45. UN News. (2026a, August). Thousands of seafarers remain trapped in the Gulf. <https://news.un.org/en/story/2026/08/1168121>
46. UN News. (2026b, September). IMO warns precise Black Sea casualty figures cannot be confirmed. <https://news.un.org/en/story/2026/09/1168297>

47. United States Energy Information Administration. (2026a). World oil transit chokepoints. https://www.eia.gov/international/content/analysis/special_topics/World_Oil_Transit_Chokepoints
48. United States Energy Information Administration. (2026b). Middle East crude tanker rates reach highest level since 2005. Today in Energy. <https://www.eia.gov/todayinenergy/detail.php?id=67386>
49. United States Energy Information Administration. (2022). Tanker rates rise following Russia's invasion of Ukraine. Today in Energy. <https://www.eia.gov/todayinenergy/detail.php?id=52498>
50. United States Maritime Administration. (2026). Advisory 2026-006: Red Sea, Bab el-Mandeb Strait, Gulf of Aden, Arabian Sea and Somali Basin - Houthi attacks. <https://www.maritime.dot.gov/msci/2026-006-red-sea-bab-el-mandeb-strait-gulf-aden-arabian-sea-and-somali-basin-houthi-attacks>
51. Węcel, K., Stróżyna, M., Szmydt, M., & Abramowicz, W. (2024). The impact of crises on maritime traffic: A case study of the COVID-19 pandemic and the war in Ukraine. *Networks and Spatial Economics*, 24(1), 199-230. <https://doi.org/10.1007/s11067-023-09612-0>
52. Yap, W. Y., & Yang, D. (2024). Geopolitical tension and shipping network disruption: Analysis of the Red Sea crisis on container port calls. *Journal of Transport Geography*, 121, 104004. <https://doi.org/10.1016/j.jtrangeo.2024.104004>
53. Zhang, Z., & Liu, X. (2026). Geopolitical conflicts and the restructuring of maritime transport networks: The causal effect of the Red Sea crisis on port throughput. *Frontiers in Marine Science*, 13, 1863362. <https://doi.org/10.3389/fmars.2026.1863362>



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