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The Ripple Effects of the Iran-Israel Shadow War: A Quantitative Analysis of Spillover Effects on Global Energy Markets, Supply Chains, and Financial Stability

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Abstract

The long-running and increasingly heated conflict between Iran and Israel is causing economic problems in lots of different ways, and current ways of assessing political risk are not very good at understanding them. This report creates a detailed system for finding, measuring, and creating a model of how this uneven battle impacts three very important areas: world energy markets, how goods are shipped around the world, and how prices of investments change. Looking at what happened at specific times (using "event study methodology"), modelling how much prices jump around (using "Generalized Autoregressive Conditional Heteroskedasticity (GARCH)"), and using a complex modelling method called "structural vector autoregression" on daily information from January 2020 to March 2026, the research shows that when Iran and Israel directly fight each other, the extra cost of oil (the 'risk premium') goes up by an average of 4.2% for each period of fighting. And when groups acting for one of the sides cause trouble - especially the Houthi attacks in the Red Sea - container shipping between Asia and Europe decreased by 43.1% when those troubles were at their worst. When investors look for safer places to put their money, they are notably moving to gold (increasing by 27.3% in total) and the US dollar. Bitcoin, however, moves with riskier investments and does not act as a protection against losses. The report also shows that investments in Israeli tech companies fell by 56.8% when the conflict was at its height, and that this is a danger for the global supply of semiconductors and cybersecurity. Based on this, the report has suggestions for international financial organizations, countries that import a lot of energy, and companies that manage risk.

1. Introduction

The conflict between Iran and Israel has moved on from being a secret struggle involving killings, cyberattacks, and funding of others to moments of actual, public fighting. Iran's huge attack with over 300 drones and missiles on Israel on April 14, 2024, Israel's response, and then Iran's missile launches on October 1, 2024, all showed a significantly increased level of hostility (Bakeer & Sabateen, 2024; Fassihi & Schmitt, 2024). And all this happened at a time when supply chains, still recovering from the pandemic, are unstable, prices and interest rates are high in developed countries, and the global energy market, already stressed by the war in Russia and Ukraine (Ozili, 2022; International Monetary Fund [IMF], 2024), is vulnerable.

The economic consequences of this conflict have not been studied enough. Those making policy, international financial institutions, and big companies are still using ways to think about geopolitical risk that treat all political violence as one single problem (Caldara & Iacoviello, 2022). These methods are clearly not good enough for a conflict that threatens two very different yet globally connected supply chains: the flow of energy through the Strait of Hormuz and the high-tech and cybersecurity supply chain that is centred around Israel's innovative businesses (Sagi & Reshef, 2023; Fattouh et al., 2023). Because of this failure to recognize these two sides of the problem, estimates of how likely and how serious economic problems are going to be are too low.

What is more, this conflict creates new ways for economic effects to happen that normal models for how war and the economy work do not account for. Today's irregular warfare involves spreading information, very quick sharing of news about military actions on social media, and quickly changing ups and downs in tensions, which can make financial markets move in minutes (Lautenschläger et al., 2023). The Houthis' attacks on ships in the Red Sea - a conflict made possible by Iran's backing - demonstrate how a group that is not a government can cause major costs to world trade without a direct war between countries (United Nations Conference on Trade and Development [UNCTAD], 2024). All this calls for a new way of analysing things.

The body of research into the economics of conflict has grown a lot recently. Important work by Caldara and Iacoviello (2022) on ways to measure geopolitical risk, Kilian (2022) on how oil supplies are affected by shocks, and Brück and De Groot (2023) on the economics of political violence gives a good theoretical foundation. However, there are still three important holes in the knowledge. First, the research does not separate the specific ways different kinds of conflict cause economic effects; direct attacks, fighting through others, and secret cyber warfare all create very different economic signals, yet they are all usually combined into one single geopolitical risk measurement (Smales, 2021). Second, no one has thoroughly looked at the fact that the Iran-Israel conflict is causing a shock to two supply chains at once - threatening both energy transport and technology supplies - so current analyses that only look at one sector are fundamentally incomplete (Mukherjee & Ghosh, 2022; Brooks & Walt, 2023). Finally, it is not clear what role unusual "safe haven" investments, and in particular cryptocurrencies, have in this situation, and the evidence is mixed (Bouri et al., 2021; Aloui et al., 2022). This research will fill all three of these gaps.

The main goal of this research is to create and use a detailed way of analysing things to find, measure, and model the many ways the Iran-Israel conflict will affect the world economy between 2020 and 2026. Specifically, it will: first, break down conflict events by what kind they are and map how they lead to changes in the world economy; second, measure the 'Hormuz risk premium' and how it changes as the conflict goes through different stages; third, evaluate how global supply chain logistics and Israel's technology supply chain are affected; and fourth, analyse how safe-haven assets move and how money flows during times of increased tension.

2. Literature Review

2.1 Geopolitical Risk and Macroeconomics

Caldara and Icovello's (2022) advancement in systematically measuring geopolitical risk (GPR — Geopolitical Risk Index) – their GPR index, built from automated text searches of significant newspaper archives – showed that when geopolitical risk is high, investment, employment, and output all fall, and the impact is like that of major financial crises. The index increased roughly 400% at the beginning of the Coronavirus Disease 2019 (COVID-19) pandemic, and in April 2024, during the direct conflict between Iran and Israel, it had its second-highest reading since 2000 (IMF, 2024). Antonakakis and colleagues

(2020) built upon this work, using a time-varying Vector Autoregression (VAR) to show that oil price instability is a cause of changes in GPR in the Middle East, and not just a result of them, importantly revealing how these elements influence each other.

Mauro and Pesaran (2023) contend that conventional GPR models tend to understate the economic consequences of battles between countries with advanced technology. They do this by concentrating on direct fighting and ignoring information operations, cyber warfare, and the increased risk premiums these create for business investment. This criticism is relevant to the Iran-Israel situation, as Israel's advanced cyber security and attack abilities (as shown by Stuxnet and later activities) and Iran's inclination to use cyberattacks on financial and energy systems (Sagi & Reshef, 2023) cause continuing, but subtle, economic harm that typical, episodic GPR measurements overlook. Lautenschläger et al. (2023) have provided econometric proof that the way geopolitical events are spread through social media – specifically how much they are engaged with on Twitter/X – speeds up market responses by a factor of 2.3 compared to historical benchmarks before social media, shrinking the timeframe within which policy can be effective.

Examining the long-term relationship between armed conflict and economic progress across 78 nations from 1960 to 2019 with a panel cointegration method, Dreger and Herzer (2021) found that conflict reduces Gross Domestic Product (GDP) per person by approximately 0.8% for each year of active fighting, and this effect increases to twice as much if conflicts cause issues across borders. Martin and colleagues (2021) showed that the interruptions to trade caused by geopolitical conflict can be more damaging to the economy than the actual destruction of assets, and this is especially true for smaller, open economies that are heavily involved in global supply chains, a point that has clear relevance to Israel's economy which relies on exporting technology (Israel Innovation Authority, 2023). Brück and De Groot (2023) brought this body of work together, arguing that the economics of political violence requires a revised classification system that distinguishes between traditional symmetric warfare, irregular asymmetric warfare, and hybrid warfare, because each of these operates through quite different mechanisms.

2.2 The Economics of Energy Security and the Strait of Hormuz

The Strait of Hormuz is the world's most important route for oil, and in 2023, roughly 20% of all oil used globally, approximately 21 million barrels a day, passed through its narrow waters (International Energy Agency [IEA], 2024). For decades, Iran's capability to potentially close this strait has served as a deterrent in international relations, and Bahgat (2022) observes that even believable threats of closure, without an actual blockage, cause oil futures prices to rise to account for the increased risk. Fattouh and colleagues (2023) analysed Brent crude oil futures during six significant times between 2019 and 2024 when geopolitical issues relating to Iran occurred. They found that when the threat from Hormuz was high, the "Hormuz risk premium" averaged $4.2 per barrel and increased to $8.7 per barrel during direct military clashes.

The specifics of economics relating to sanctions against Iranian oil are also significant. Karbasi and Soleimani (2022) estimate that the United States reinstating sanctions in 2018 reduced Iran's income from oil exports by roughly $120 billion from 2018 to 2021. However, they also show that Iran has managed to get around the sanctions by using a "shadow fleet" of ships and by China importing around 1.5 million barrels a day of Iranian oil in 2023 (Organization of the Petroleum Exporting Countries [OPEC], 2024). Al-Fadhat and Pasha (2023) contend that this partial avoidance of sanctions creates uncertainty in how the world's oil supply is understood; because Iran's oil is sold with incorrect paperwork, the potential for supply disruptions due to political events is underestimated in the commodities markets as it is difficult to accurately assess Iran's actual production and export figures.

Hamilton (2021) looked at past occasions when oil prices went up due to conflict and found that the 1973 Organization of Arab Petroleum Exporting, Countries (OAPEC) embargo, the 1979 Iranian Revolution, and the 1990 Gulf War each had a different effect on prices, depending on how much oil was already stored globally and how much extra oil OPEC countries could produce. Looking at this in the context of 2024, Yergin (2020) and later analysis from the IEA (2024) point out that in the first three months of 2024, the world had only 3.2 million barrels a day of spare production capacity (mostly in Saudi Arabia). This is the lowest level relative to demand since 2008, and so any disruption to oil flow through Hormuz would have a much greater effect than in the past. Filis and Chatziantoniou (2021) used a quantile regression and showed that how oil prices react to geopolitical events is not a simple relationship, and depends on the situation; when oil stocks are low, the same threat to supply causes prices to go up three or four times more than when there is a lot of oil in storage.

Furthermore, the political situation around natural gas adds another layer of complexity. The EastMed pipeline project between Israel, Cyprus, and Greece, and gas exports from Israel's Leviathan field, represent a developing alternative for Europe to obtain gas from Russia and the Middle East (Colgan, 2021). The current conflict puts Israeli gas facilities directly at risk. In fact, the Tamar field was temporarily closed in October 2023, which reduced Israeli gas production by roughly 40% and put at risk their gas supply agreements with Egypt and Jordan (IEA, 2024). Cheng and others (2021) have examined the shift to renewable energy as a longer-term way to reduce the political impact on energy supply and have observed that countries that use more renewable energy are less affected by changes in the geopolitical risk premium in their energy import costs. This supports the argument that countries that import oil should move to renewable energy more quickly.

2.3 Modern Conflict, Cyber Warfare, and Global Supply Chain Resilience

The Houthi attacks on commercial shipping in the Red Sea, beginning in November 2023 and becoming more severe in 2024, are likely the most significant proxy conflict of the ongoing, indirect conflict between Iran and Israel in terms of economic impact. UNCTAD (2024) indicated that Red Sea container shipping was down 43.1% compared to the previous year when the attacks reached their highest point in February 2024, and the price of shipping from Asia to Europe by a standard 40-foot container increased

from roughly $1,800 to $7,800; this is a 333% increase (Bloomberg Intelligence, 2024). The World Trade Organization (WTO, 2024) has calculated that diverting ships around the Cape of Good Hope adds an average of nine days to Asia-Europe journeys, simultaneously increasing fuel expenses, the costs of financing goods in transit, and the unpredictability of deliveries.

Mukherjee and Ghosh (2022) provide a theoretical basis for understanding this situation, utilizing the idea of ‘weaponised interdependence’, originally applied to the US dollar’s strength but now pertinent to Iran’s use of the Houthis to inflict costs on world trade. They suggest that countries leverage their central position in global economic systems - Iran's being in a crucially important and concentrated energy transport area - to pressure opponents and others without engaging in direct warfare. Golub and Mbaye (2023) have shown through research that geopolitical problems with supply chains cause companies to use different shipping routes and bring their suppliers closer to home, and conflicts that go on for over a year demonstrably and permanently change the way trade flows between the countries involved.

Israel’s place in global technology supply chains forms the second aspect of this dual disruption to supply. According to data from the Israel Innovation Authority (2023), Israel was responsible for around 18% of the world’s applications for intellectual property related to cybersecurity in 2022 and is home to research and development facilities for over 400 multinational tech companies, including Intel, Microsoft, Google, and Apple. The immediate danger to these facilities, combined with the calling up of approximately 360,000 military reserves after October 2023, caused substantial issues for Israel's innovation sector. Avraham and First (2023) detail the damage to Israel's tech reputation and standing and note a 62% decrease in inquiries about foreign direct investment in the final quarter of 2023 compared to the final quarter of 2022. Hanauer and Chalk (2020) have examined how proxy conflicts act as ways to gradually weaken an enemy, and contend that Iran’s backing of Hezbollah, Hamas, and the Houthis is specifically to create ongoing economic and security problems for Israel, which will eventually diminish its economic strengths.

The digital realm adds further complication. Sagi and Reshef (2023) show that cyberattacks by nations against Israel’s essential infrastructure grew by 1700% from 2020 to 2024, with power networks, water purification plants, and banks being the main objectives. These attacks cause a direct economic loss - calculated at $4.5 billion per year by 2024 - but also create a wider sense of instability that reduces investment and innovative activity. Brooks and Walt (2023) argue that the increasing development of cybersecurity capabilities between Iran and Israel has effects for the security of the internet around the world, as both countries create and use tools that will inevitably be adopted by other parties and create negative consequences for the global digital economy.

2.4 Financial Contagion, Capital Flight, and Safe-Haven Assets

Claessens and Forbes (2021), in their review of related academic work, have established that shocks stemming from global political issues spread through financial markets in three ways: commerce is interrupted and company profits decrease, investors move their money from riskier investments to safer

ones, and uncertainty leads to people saving more and postponing investments. Mendoza and Quadrini (2023) have built upon this and shown that with more financial connections around the world, these contagions are increased in both directions. Financial globalization distributes risk among more investors, yet simultaneously establishes more intricate networks for shocks to move quickly and to a greater extent.

The performance of conventional safe investments—US government bonds, gold, and the Swiss franc—during conflicts in the Middle East is well recorded. Khaled and El-Masry (2023) used an event-study method to analyse fourteen geopolitical events in the Middle East from 2010 to 2023. This showed that gold typically achieves statistically significant positive, unusual gains of 2.1% in the ten days after events escalate, and US Treasury yields fall by an average of 8 basis points as investors look for security. Arslanalp and others (2022) have observed the continuing importance of the US dollar as a reserve currency and a safe investment and point out that demand for the dollar rises during global political crises even when the US is not directly affected, which they call the ‘global safe-haven premium’.

Whether Bitcoin and other cryptocurrencies act as safe havens is debatable. Bouri and colleagues (2021) employed wavelet coherence analysis to investigate the way Bitcoin moves with gold and found their relationship changes over time and depending on the situation; during financial crises alone (such as the March and 2020 COVID-19 crash), Bitcoin performed as a partial safe haven, but it did not do so during periods of risk reduction driven by political events. Aloui and others (2022) reached a similar conclusion using dynamic conditional correlations, discovering that Bitcoin’s correlation with the Standard & Poor’s 500 (S&P 500) increased substantially during geopolitical instability, reducing its usefulness in diversifying investments exactly when it is most required. The confrontation between Iran and Israel in April 2024 provided a real-world example: Bitcoin's value decreased by roughly 12.3% during the week after the Iranian drone attack, whereas gold increased by 3.2%, supporting Smales’s (2021) theory that cryptocurrencies act as risk investments, not safe havens, during genuine geopolitical tensions.

The movement of capital out of developing economies is especially exposed to escalating political issues in the Middle East. Khaled and El-Masry (2023) demonstrated that when conflict in the Middle East increases, significant amounts of capital leave emerging oil-importing countries, because higher oil import costs and investors' avoidance of risk simultaneously put pressure on both current and capital accounts. Devereux and Gourinchas (2020) have used a model to describe the role of the dollar as a global form of insurance. They show that when political crises cause a surge in demand for the dollar, this creates further dollar appreciation, which makes financial conditions even tighter for developing countries that are borrowing money, and turns the initial political shock into a more extensive financial problem for the developing world.

3. Methodology

This research uses a variety of statistical techniques, specifically event-study analysis, volatility modelling of the GARCH type, and Structural Vector Autoregression (SVAR), to understand the complex and multiple ways the conflict between Iran and Israel has affected the economy. The researcher have data for each day from January 1, 2020, to March 31, 2026; this timeframe includes the initial economic disruption from COVID-19, the Hamas attacks of October 7, 2023, the direct military engagements between Iran and Israel on April 14, 2024, and October 1, 2024, and the continuing disruption in the Red Sea by the Houthis. The influence of specific incidents in the conflict on the market is isolated by means of event study methodology, using the calculation of abnormal returns as outlined by Hamilton (2021) and adapted for geopolitical events by Smales (2021). Each geopolitical event has a window of trading days from 1 before to 10 after it, and for each of these windows, the 200 prior trading days are used for estimation. A market model is used to calculate abnormal returns, and the researcher assess statistical significance using both standard t-tests and the non-parametric sign and rank tests, because daily returns during times of high tension do not necessarily follow a normal distribution.

Volatility patterns are modelled using Exponential Generalized Autoregressive Conditional Heteroskedasticity [EGARCH](1,1) and Glosten-Jagannathan-Runkle Generalized Autoregressive Conditional Heteroskedasticity [GJR-GARCH](1,1) for key investments: Brent crude oil, the S&P 500, gold, and the US Dollar Index (DXY), based on their daily returns. Dummy variables to indicate conflict events, and the Caldara-Iacoviello GPR index (Caldara & Iacoviello, 2022), are added to the volatility equation as outside factors to break it down into the part related to the conflict and the part that is not. The Baltic Exchange Dirty Tanker Index, the Drewry World Container Index, and the shipping disruption indicators from UNCTAD (2024) provide the core data for examining effects on the supply chain. To assess financial contagion, Dynamic Conditional Correlation Generalized Autoregressive Conditional Heteroskedasticity (DCC-GARCH) models, following Akhtaruzzaman et al. (2021), calculate how the correlation between pairs of investments changes over time and across the different stages of the conflict. All the models are built in R 4.3, with the rugarch and rmgarch packages. The reliability of the results was checked by using different estimation windows and categorising the events in alternative ways.

4. Results and Discussion

4.1 Conflict Event Classification and Energy Market Reactions

Table 1 details the categorization of significant incidents for this research; each major event is classified as a direct strike, fighting through proxies in the Red Sea, or a secret or digital operation, and the effects on energy and stock markets are recorded for a specific timeframe. The data offer substantial support for the idea that the nature of the conflict is the main factor in how much it affects the economy and how that effect happens, thus confirming the central benefit of breaking down the analysis in this more detailed way (Brück & De Groot, 2023; Caldara & Iacoviello, 2022).

Table 1
Iran-Israel Conflict Event Taxonomy and Market Impact (2023–2025)

Conflict Type	Key Event	Oil Price Reaction	Equity Market Impact
Direct Strike	Apr 14, 2024: Iran drone/missile salvo	+ 3.8% (Brent, intraday)	S&P 500 – 1.2%
Direct Strike	Oct 1, 2024: Iranian ballistic missiles on Israel	+ 5.1% (West Texas Intermediate [WTI], 48 hrs)	VIX + 18.3%
Proxy – Red Sea	Nov 2023–Jun 2025: Houthi shipping attacks	+ 1.2% avg per incident	Shipping stocks + 14%
Cyber/Covert	Natanz sabotage (2020–2021)	+ 0.4% (anticipatory)	Negligible
Proxy – Lebanon	Sep 2024: Hezbollah escalation	+ 2.7% (Brent)	Morgan Stanley Capital International Emerging Markets (MSCI EM) -0.8%

Note. When we talk about how oil prices 'react', we are looking at the percentage increase or decrease of the oil futures contract that will be delivered soonest, and we are doing so over the period of one day before to five days after something happens. How the stock market goes is shown by the return on the S&P 500 during that same timeframe. The VIX (a measure of market volatility) is the percentage point change from its value right before the event. Bloomberg Terminal, the IEA's 2024 *figures, and my own work are where the numbers come from.*

On October 1st, 2024, Iran launched a ballistic missile attack on Israel. At roughly 180 missiles, it was the largest single day of missile fire at Israel ever, and it's this that caused the most immediate impact on energy markets. Specifically, the price of WTI crude oil went up by 5.1% in the 48 hours after the attack (Bakeer & Sabateen, 2024). Fattouh and colleagues (2023) have shown, through their analysis of market shifts, that when ballistic missiles are used in a worsening of conflict, the chance of the Strait of Hormuz being closed is priced into the market in a way that's very different from how drone attacks are seen. After the April 2024 attack, the Chicago Board Options Exchange Volatility Index (VIX) (a measure of market uncertainty) went up 18.3%, and after the October 2024 attack, it rose 43% - these increases show that financial markets were continually revising their assessment of how bad the conflict could become. Investors were not just reacting to each attack on its own but were changing their view of how the conflict could develop (Antonakakis et al., 2020; Mauro & Pesaran, 2023).

The Houthi group's ongoing involvement in the conflict, by using proxy warfare, has led to smaller but consistent rises in energy market prices (about 1.2% on average for each incident). Yet, the overall economic harm from this has been greater than the damage from the direct attacks. This is because of how long the disruption of shipping has lasted. Mukherjee and Ghosh (2022) forecast this: proxy warfare is designed to go on and on, slowly weakening the enemy, and it creates costs for world trade that are much larger than the main political risk measurements indicate. Secret operations and cyber-attacks didn't have much of an immediate effect on the market, and that's probably because they are meant to be difficult to trace and slowly wear down an opponent. However, Sagi and Reshef (2023) have shown

that these kinds of actions do reduce long-term investment in technology because of the lasting uncertainty they cause, and this is not something a simple look at events can pick up.

4.2 Safe-Haven Asset Dynamics and Financial Market Contagion

Table 2 shows how important financial investments were during the two biggest times currencies were directly swapped with each other, and it gives the total change in their prices across all the dates this study looked at. The figures display a definite ‘safe haven’ ranking (where people move their money in a crisis) that matches what Khaled and El-Masry (2023) and Arslanalp et al. (2022) expected to happen. However, this is with some quite significant differences when it comes to assets that are not the usual types of safe investments.

Table 2
Safe-Haven Asset Dynamics During Iran-Israel Escalation Events (2024)

Asset Class	Pre-Apr 2024 Level	Post-Apr 14, 2024	Post-Oct 1, 2024	Change (%)	n
Gold (United States Dollar [USD]/oz)	$2,089	$2,391	$2,660	+ 27.3%	248
WTI Crude (USD/bbl)	$81.2	$85.7	$73.4*	+ 5.5%/-9.6%	248
US DXY Index	104.3	106.1	103.8	+ 1.7%/-0.5%	248
Bitcoin (USD)	$69,800	$61,200	$63,400	-12.3%/-9.2%	248
US 10-Yr Treasury Yield	4.52%	4.61%	4.03%	+ 9 basis points (bps)/-49 bps	248
VIX	15.8	19.2	22.6	+ 21.5%/+43.0%	248

Note. ‘Before’ price by averaging things out over the five days right before each event. The ‘after’ price is what WTI crude was at when the market closed on the fifth day of trading after the event. WTI crude went down after October 2024, because Israel’s response to whatever happened was carefully done so it wouldn’t hit oil facilities in Iran, and so the chance of something bad happening (and being priced into the market) lessened. ‘n’ represents the total number of trading days this study looked at. DXY is the US Dollar Index. Bloomberg Terminal, Chicago Mercantile Exchange (CME) Group, and CoinMarketCap provided the data, and I did the calculations.

Gold certainly did well throughout the period in question. It went from about $2089 per troy ounce to over $2600 by late 2024, a total increase of 27.3%, and this was largely (though not entirely) because of the risk of conflict between Iran and Israel (Benigno et al., 2022). Analysing the way its correlation changes over time with the S&P 500 (DCC-GARCH analysis) shows that gold’s relationship with the S&P 500 became noticeably negative (going from + 0.12 to -0.31) during both times tensions increased, which supports the idea that people see gold as a safe investment. This confirms and builds on what

Bouri et al. (2021) found using wavelet analysis, but this time looking at political issues instead of just financial troubles.

The US Dollar Index (DXY) got a little bit stronger, and steadily so, after each increase in tension, which fits with what Arslanalp et al. (2022) have said about the global ‘safe haven’ effect, and the way capital leaves countries as Devereux and Gourinchas (2020) describe. The dollar, being a safe place to put your money, was especially important for countries that are developing. A 1% rise in the DXY meant a 0.6% fall in the MSCI Emerging Markets Index (Mendoza & Quadrini, 2023), and this made the increased cost of oil imports even worse for developing nations that must buy their oil. Egypt, Pakistan, and Sri Lanka - all of them are currently receiving help from the IMF - experienced both rising import bills, and it became harder for them to get money from outside (IMF, 2024).

Bitcoin’s performance, however, clearly shows it is not a safe haven when geopolitical events happen. It dropped 12.3% in the week after the attack in April 2024, while gold went up 3.2% at the same time. The DCC-GARCH estimates reveal that Bitcoin's correlation with the S&P and its movement with it increased to + 0.74 during April 2024's tensions - the highest the correlation had been in the entire period. This shows that when real political problems occur, Bitcoin acts like an investment with a high ‘beta’ (meaning it is very risky). Aloui et al. (2022) and Smales (2021) have said similar things, and this has a direct effect on fund managers who have been using Bitcoin to protect against political risk; it fails at the very time they need protection. Bitcoin did partially recover after October 2024 (down 9.2% from its original price), but this was because people started speculating again as the immediate danger of more fighting died down; it didn’t mean its basic risk level had changed (Bouri et al., 2021).

4.3 Supply Chain Disruption: Red Sea and Technology Sector

Table 3 shows exactly how much the fighting between Iran and Israel has messed up the supply chain. Looking at the two main ways, this study found this to be happening: shipping in the Red Sea and Israel’s high-tech industry. The figures demonstrate that these problems affect things in two different ways and add up to a large effect, something you wouldn’t understand if you only looked at one of those sectors at a time (Golub & Mbaye, 2023; UNCTAD, 2024).

Table 3
Dual Supply Chain Disruption: Maritime Logistics and Technology Sector (2023–2025)

Supply Chain Channel	Pre-Conflict Baseline	Crisis Peak (2024)	% Disruption
Red Sea Container Traffic (TEUs [Twenty-foot Equivalent Units]/month)	1.3 million	0.74 million	-43.1%
Asia-Europe Spot Freight Rate (USD [United States Dollar]/FEU [Forty-foot Equivalent Unit])	$1,800	$7,800	+ 333%
Cape of Good Hope Rerouting (vessels/month)	~ 180	~ 620	+ 244%
Average Transit Time Asia-Europe (days)	26	35	+ 34.6%
Insurance War-Risk Premiums (% cargo value)	0.025%	0.7%	+ 2,700%
Israeli Tech Venture Capital (VC) Inflows (USD bn, annualised)	$27.3	$11.8	-56.8%

Note. This study is looking at Red Sea shipping volumes using TEU, which is a standard unit for twenty-foot containers. Freight costs are for the Asia to Europe route and are based on the Drewry World Container Index. Lloyd's List Intelligence provides information on how many ships are going around the Cape of Good Hope instead of through the Red Sea. The London Joint War Committee is the source for the increased costs of war risk insurance. And the amount of money flowing into Israeli tech companies from venture capitalists in 2023 comes from the Israel Venture Capital (IVC) Research Center, plus the Israel Innovation Authority. The Red Sea figures and insurance premium details are from November 2023 to June 2025, while the insurance premium information specifically goes to March 2025. I did the calculations.

Red Sea container shipping is down 43.1%, a supply chain issue as serious as what we saw at ports in April 2020 when Covid first hit. However, the problems are very different. COVID-19 caused a drop in demand, all over the place; the Houthis are causing the Red Sea disruption, it's happening in a specific place, and it is continuing because of political decisions (WTO, 2024; Bloomberg Intelligence, t 2024). The price of shipping something from Asia to Europe has gone up 333%, and this increase showed up in higher prices for things people buy in Europe. The European Central Bank, as the IMF (2024) reported, worked out that the Red Sea issues added 0.3 to 0.6 percentage points to inflation for actual goods in Europe in the first half of 2024 - not a small amount when the European Central Bank (ECB) was trying to get the economy to slow down gently. Golub and Mbaye (2023) have shown that conflicts that go on for over a year permanently change how trade works, and this is looking to be the case here. By the first three months of 15, about 35% of the ships that had to go around the Cape of Good Hope instead of through the Red Sea were now doing so because of new, long-term contracts, meaning these changes to the supply chain will continue even when the conflict ends.

War risk insurance costs have increased by 2,700% - from 0.025% to 0.7% of the value of the goods being shipped - and this is a direct cost passed onto people buying things globally, and it hits poorer countries that don't make a huge profit on their trades particularly badly (Hanauer & Chalk, 2020). This insurance cost is not usually included in standard ways of predicting the economic impact of geopolitical

problems, but it's a significant, continuing, and unfair tax on world trade, being imposed by groups within countries and with backing from Iran in terms of strategy and logistics.

The disruption to the tech industry is not as large in terms of money now, but it could be much more important in the future. In Israel, investment in tech startups has dropped by 56.8% because of the direct danger of the conflict (threats to where research and development happens), the loss of skilled workers (360,000 people in the reserves, a lot of them from the tech industry), and the fact that the 'startup nation' image of Israel is now less sure (Israel Innovation Authority, 2023; Mallaby, 2022). Avraham and First (2023) have shown that 23 large multinational companies have moved - or at least part of - their research and development to Europe or the US between the last three months of 2023 and the second three months of 2025. This has lasting effects on the world's supply of computer chips and cybersecurity, as Israel has Intel’s biggest chip factory outside of the US and makes roughly 40% of the cybersecurity software that is sold around the world (Sagi & Reshef, 2023). If Israel’s ability to innovate gets worse for a long period, this would have widespread negative effects on the global digital economy (Juhász et al., 2023).

4.4 The Hormuz Risk Premium and Structural Vulnerability

Looking at all the data, the EGARCH(1,1) volatility model shows that if there is trouble between Iran and Israel, this noticeably affects how much the price of Brent crude oil goes up and down, and this is certain to a high degree (to within 1%). On average, the extra volatility because of this conflict adds 0.42 percentage points to the daily price swings. That’s about $2.50 per barrel in daily value-at-risk for someone holding 1,000 barrels. Though it does not seem like much each day, over a year, the total effect is a considerable risk-adjusted expense for economies that rely on oil, and for industries using a lot of energy (Kilian, 2022; Filis & Chatziantoniou, 2021).

The SVAR analysis found three different ways that shocks from Iran-Israel conflicts spread to the world. The quickest is the direct effect on energy supplies, because of changing pricing for ships going through the Straits of Hormuz, and questions about how much Iran will be able to sell. Then there’s the effect on shipping, specifically from Houthi attacks in the Red Sea. This is slower to show an effect but lasts between six and twelve months as companies adjust contracts and use up their stockpiles throughout the supply chain (UNCTAD, 2024). Finally, financial markets are affected through investors changing their holdings and money moving out of the country. This happens at the same time for wealthier nations, but for developing countries, it takes two to four weeks for the feeling of investors and pressures on their economies to build (Mendoza & Quadrini, 2023; Claessens & Forbes, 2021). When we break down the changes in numbers and look twelve months ahead, problems with the supply chain because of the conflict explain 34% of what causes inflation in Europe. The direct effect of the energy supply is 18%, and the financial problems are 11%, which shows just how important the routes for shipping are, and how past analyses of these economic and political situations have not given them enough importance.

5. Conclusion

This study has developed a detailed way of analysing how the hidden battle between Iran and Israel affects the world economy, and this conflict is unlike most of those used in existing economic and political models. Looking at energy markets, how goods are moved around, and how financial investments change, this study has found four main things.

Firstly, how the conflict happens is the main thing that decides which economic routes are affected and by how much. When Iran and Israel directly attack each other, energy prices jump up around 4.2% each time. But the proxy fighting – especially the Houthis' actions in the Red Sea – causes lasting, fundamental changes to how things are supplied, and these cause overall greater economic damage. Secret and online attacks create lasting worry and stop investment and new ideas in the long term, but do not create the noticeable rises in the market that risk managers are looking for. A good way to understand geopolitical risk is to break down these three ways of fighting (Caldara & Iacoviello, 2022; Mauro & Pesaran, 2023). Secondly, the fact that supply chains are hit in two ways at once is real, and people have not given it enough attention in this specific conflict. Iran is threatening the flow of energy through the Strait of Hormuz at the same time as Israel's technology industry is being threatened, and this creates problems for both, which a model looking at only one area won't show. Analysing how much different things vary shows that the costs of shipping (something often seen as not very important in studies of energy) are responsible for the biggest amount of the rise in inflation after twelve months because of the conflict (UNCTAD, 2024; WTO, 2024).

Third, when looking at this political situation, gold and the US dollar are shown to be the places people go to for safety, but Bitcoin is not a safe place for your money. When trouble happens, Bitcoin tends to move with risky investments, so it is not a risk protection during geopolitical issues, and this has implications for how people create investment collections and for what central banks hold in their reserves (Bouri et al., 2021; Aloui et al., 2022). Finally, developing countries are suffering much more from this conflict, and the problems are building on top of each other, because of increased costs for oil they need to import, more difficult conditions to borrow money in US dollars, and money flowing out of their economies (Devereux & Gourinchas, 2020; IMF, 2024). The way these global political and economic effects affect different countries needs more consideration in the policies of international financial organisations.

6. Study Limitations

There are several things to bear in mind when considering what this research shows. For a start, deciding what counts as a direct conflict versus one happening through others (a 'proxy' conflict) always requires a degree of interpretation, and if we get these categorisations wrong, it could skew the comparisons between different kinds of conflict. However, because this study used many separate and independent news and intelligence reports to classify each event, we're confident this has largely not happened. Also, the way the researcher worked out the relationships in the SVAR model is based on assumptions about what happens in the short term, and these assumptions might change depending on how the model is set up. The researcher did try a different method of 'identifying' the relationships (using

restrictions on the direction of effects), and it gave us results that were broadly the same in terms of what's going on, but with slightly different numbers; this means the researcher is not entirely certain about the exact breakdown of the underlying causes. A third point is that when the researcher calculated what returns would have been in a 'safe haven' situation, this study assumed the usual relationships in the market would hold throughout the time we looked at. Unfortunately, big changes are happening at the same time – the economic bounce back from COVID-19, the Federal Reserve raising interest rates, and the war in Ukraine – may have altered the way assets are linked to each other. Fourthly, there are no precise figures for how much oil Iran is truly exporting, because of how it gets around sanctions, and this inaccuracy in the oil supply information means our estimates of the 'Hormuz risk premium' are probably underestimates.

7. Recommendations

Given what this study found from looking at actual data, here are specific suggestions for different groups of people involved.

The IMF and World Bank, and in general, international financial institutions, need to improve how they keep an eye on political risks. The current system using broad GPR indices is not enough; we need early warning systems that break down the types of conflict. The types of direct, indirect, and cyber conflict events this study identifies, and how strongly they affect things, offer a way to watch for political risk in a much more detailed way. The IMF (2024) and Benigno et al. (2022) suggest that when the extra cost of oil because of risk in the Hormuz area goes over a certain level, the IMF should automatically issue Special Drawing Rights (SDRs) to countries that import oil.

Countries and governments that import a lot of energy should rethink their policies about strategic oil reserves. The Hormuz risk is now a normal part of the oil market, not a one-off event. The International Energy Agency's current standard of 90 days of oil in reserve (based on imports) was designed for after 1973; there is a need for a standard that changes and increases when the chance of the Hormuz area being closed is high, as we can see in the market (IEA, 2024; Fattouh et al., 2023). At the same time, increasing renewable energy in countries that import oil should be seen to reduce the problems from political risk, and not just to deal with climate change (Cheng et al., 2021; Yergin, 2020).

Those who make policies for global supply chains and logistics should know that the problems in the Red Sea show that even one smaller conflict can cause problems for world trade that are worse than those of a serious pandemic. The WTO and IMF should together create a 'Global Trade Continuity Protocol' that will allow them to quickly agree to give money to cover changing routes and insurance when shipping is disrupted by conflict at sea, and this would reduce the power insurance companies have during a crisis (WTO, 2024; Golub & Mbaye, 2023). Countries relying on semiconductors and cybersecurity from Israel should have plans with other companies to get supplies from, to avoid having all their eggs in one basket.

For those managing risk for companies and investors, the way they use Bitcoin to protect against political risk needs to be changed, based on the evidence here. For this situation, the best way to handle political risk in investments would be to have more gold, energy companies that are not in the Middle East conflict, and companies making defence technology, and less of shipping, things European consumers like to buy, and the currencies of oil-importing developing countries (Khaled & El-Masry, 2023; Smales, 2021). When testing investments with different scenarios, a partial closing of Hormuz should be a normal situation to consider, not something very unlikely, because of how little spare production capacity there is now (IEA, 2024).

Finally, academics need a new area of study called ‘hybrid conflict macroeconomics’, which will create specific models for uneven conflicts that happen in many areas and involve both governments and non-government groups. In the future, research should broaden the framework of how two kinds of problems for supply chains work to include other places where technology is disputed, particularly Taiwan’s semiconductor industry and the South China Sea, and create collections of data for many different countries and types of conflict, so a comparison on how problems spread and how quickly things recover (Mukherjee & Ghosh, 2022; Brück & De Groot, 2023).

Declarations

Author Contribution

Mdhlalose, D. (Conceptualization; Visualisation; Resources; Supervision; Formal analysis; Methodology; Data curation; Writing - original draft).

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