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Geopolitical Oil Price Risk and Economic Fluctuations

Prateek Upreti
University of Arkansas at Little Rock
https://orcid.org/0009-0004-9214-3224

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Abstract

The purpose of this paper is to examine the evolving landscape of geopolitical oil price risks and their impact on global economic fluctuations during 2024 and 2025. The methodology used compares historical models that have long linked energy shocks with macro-instability, innovations in modeling with high-frequency data analysis that might suggest a more nuanced relationship. The paper also explores how determinations of oil price uncertainty, oil storage, and shifting dynamics of downside risk affect global GDP and inflation in the 2024–2025 period. It further investigates the geopolitical tensions in the Middle East and Eastern Europe producing significant short-term volatility, but also high spare capacity and strategic reserves mitigating the recessionary effects historically associated with these shocks. As the paper concludes, new findings come to light showing the emerging risks in the disorderly energy transition and the financialization of energy markets are identified.

Keywords: *Oil Price, Geopolitical Risk, Economic fluctuation, Energy shock, Inflation*

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1. Introduction

Since the 1970s, macroeconomic theory has emphasized the relationship between geopolitical instability and crude oil prices. A unique set of variables have emerged during the period of 2024–2025: a post-pandemic realignment of supply and demand, ongoing conflict in Ukraine, escalating tensions in the Red Sea, and a global shift toward decarbonization.

Traditionally, geopolitical risk has been considered an exogenous supply shock. However, recent literature increasingly views geopolitical risks as part of global macroeconomic uncertainty. The purpose of this review paper is to examine the latest evidence on the propagation of these risks through the economy, the effectiveness of inventory management as a shock absorber, and the degree to which financial speculation and physical disruptions in supply chains drive economic fluctuations.

Introducing algorithmic and high-frequency trading (HFT) into energy commodities has fundamentally changed how geopolitical headlines translate into economic fluctuations. According to research conducted in 2024, automated trading systems often lead to volatility clusters that can cause margin calls in the energy sector before one tanker has even been diverted. The financialization of tension means that global credit markets are no longer solely impacted by high fuel costs but are also affected by financial instability and capital flight within energy-focused investment portfolios.

Furthermore, the 2024–2025 period is characterized by the fragmentation of the global energy trade. The emergence of a shadow fleet and the bifurcation of markets due to sanctions have created a two-tiered pricing system. Fragmentation introduces a new type of economic risk: informational opacity. Oil trade now takes place outside of traditional Western financial oversight and reporting frameworks, which complicates central banks' ability to accurately model the oil-to-inflation" pipeline. There is an increased policy risk because of the lack of transparency, with central banks adjusting interest rates based on incomplete information regarding the true landed cost of energy in global manufacturing hubs.

2. The Mechanics of Geopolitical Risk in Oil Markets

Experts have redefined the "geopolitical risk" (GPR) index by distinguishing between threats of disruption and disruptions that actually occur. The distinction between general price volatility and downside disaster risk has occurred. The fear of a catastrophic supply loss (such as a closure of the Strait of Hormuz) can make geopolitical risk tilt toward the downside compared to standard volatility.

It has been argued in various studies that oil price uncertainty is not just a precursor to economic fluctuations, but is also determined by them simultaneously. Oil prices rise when geopolitical risk increases, leading to a precautionary demand for oil storage, causing a feedback loop that reinforces macroeconomic uncertainty.

In 2024 and 2025, the mechanics of risk have grown increasingly tied to chokepoint vulnerabilities and the weaponization of maritime insurance. According to the International Maritime Organization (2025) and other energy economists, oil movement can no longer be guaranteed as a constant, even if the global supply is adequate from a technical perspective. With the escalation of gray zone tactics, such as drone interference in the Red Sea or the threat of maritime blockades in the Strait of Hormuz, the Expected Value of Risk has been recalculated. Prior to the 1970s, conflicts in the Middle East mostly affected oil's sources. At the present time, risk mechanics are path-dependent, which means the length and security of the transit route determines the financial risk. The result has been the rise of war-risk insurance premiums that can account for as much as 10% of a barrel's final price, regardless of its fundamental value.

Furthermore, risk mechanics are now heavily influenced by sanctions-induced market bifurcation, with the global oil market effectively divided into transparent and opaque sectors by 2025. The result of this bifurcation is a friction-filled mechanical process that creates the basis for price discovery. Traditionally, risk models assume a unified global price (arbitrage-free pricing). It's important to note, however, that the existence of a shadow fleet transporting sanctioned crude via ship-to-ship transfers in international waters introduces a liquidity risk that traditional economic models cannot fully measure. As a result of this mechanical friction, when a geopolitical shock occurs, the transparent market (Brent/WTI) may overreact due to a lack of visibility into the shadow market's inventories. Due to this informational gap, global GDP fluctuations are often driven by fears of a supply vacuum amplified by the inability to accurately track over 15% of the world's daily oil flows.

3. Macroeconomic Impacts: Inflation and GDP

Inflation and growth are the primary concerns for policymakers when it comes to energy price shocks. According to 2024–2025 data, retail energy prices respond rapidly to geopolitical tensions, but decline slowly when tensions ease. The asymmetry contributes to higher headline inflation, even when crude prices are stable at the underlying level. Despite Brent crude averaging roughly $80 per barrel in 2025, inflation was stickier in 2024.

The global energy landscape remains dominated by asymmetry, particularly in Europe and North America. The spread between crude oil and retail gasoline must widen significantly before consumers see relief from this pricing behavior. For central banks, mechanical friction is more than a consumer complaint; it serves as an inflation anchor, keeping headline inflation from falling as quickly as global crude benchmarks might suggest. As a result of this lag, sticky inflation was observed in the first half of 2025, complicating interest rate pivot timing.

An oil shock must be perceived as extremely high for a sustained period of time in order to cause a global recession in the current economic environment. Although a number of regional conflicts occurred in 2024, the global economy demonstrated remarkable resilience, as non-OPEC+

countries (US, Brazil, Guyana) increased supply to offset geopolitical risks. The new models show that geopolitical oil price risk does not drive global macroeconomic volatility. It was reported at the 2025 EIA Workshop that more than half of observed oil price uncertainty is actually macroeconomic uncertainty, suggesting prior studies may have overestimated the specific impact of geopolitical events.

Moreover, in 2025 observation has quantified the second-round effects of energy shocks on core inflation and labor markets. Second-round effects involve passing through energy costs into non-energy goods and, crucially, into wage negotiations instead of a direct impact on fuel costs. According to Federal Reserve and Bank of Japan studies published in 2025, when inflation remains high because of energy volatility, workers demand higher wages. It results in a feedback loop whereby higher labor marginal costs lead to firms raising their prices on a wider scale. This mechanism was particularly visible in 2025 in energy-dependent sectors like logistics and food production, where terms-of-trade losses shifted the wage share of domestic income. Due to this, even as crude prices stabilized at year-end, the underlying inflationary forces remained high.

4. The Role of Oil Storage and Inventories

One of the most critical stabilizers identified in 2024 research is the role of storage. A macroeconomy without storage of oil would be much more vulnerable to shifts in production risk. Early in 2025, geopolitical risks spiked leading to a rise in global inventories to protect against disruptions. As with shock absorption, high levels of spare capacity (exceeding 7% of global production in 2025) have prevented oil prices from reaching the $100+ per barrel estimates that many analysts predicted at the beginning of the Red Sea crisis.

By 2025, the Strategic Petroleum Reserve (SPR) will be viewed as a bi-directional asset, meaning it will both serve as a seller and a buyer. Following the historic drawdowns of 2022 and 2023, the U.S. Department of Energy (DOE) formalized a policy of buying on the dips to refill caverns when prices fall below the $70–$75 range. When the geopolitical climate is volatile, this mechanism acts as a price floor for domestic producers, minimizing the financial risks of a sudden market collapse. This bidirectional use of the SPR provides a psychological anchor for the market, according to research by The Dispatch (2025) and Congress.gov (2025); the government subsidies part of the inventory risk that would otherwise be borne by private shale producers by signaling a guaranteed buyer at specific price points, thus encouraging upstream investment in the face of global uncertainties.

The rise of mandated commercial stockpiling will also be a mechanical shift in 2025, particularly in emerging economies like China. With the passage of the new Energy Law on January 1, 2025, China granted private oil companies a greater degree of strategic storage responsibility, requiring them to maintain higher-than-average commercial stocks. As a result, the shadow reserve blends private capital with national security objectives. This creates a buffering effect, in which the first

impact of a supply shock-such as the Red Sea shipping disruptions-is absorbed by these localized, mandated inventories before it escalates into a global price spike. There is, however, also a new risk of inventory opacity, since these mandated stocks are often not included in traditional transparency reports. Because of this, market participants face a greater informational risk in 2025, as the political directives guiding these public-private storage partnerships obscure the real state of global supply.

5. Financialization and Speculative Risk

The European Central Bank (2024) examined whether paper oil (futures and speculation) was decoupling from physical oil. While speculation increases during times of geopolitical crisis, it tends to amplify rather than create fundamental shocks. There are, however, significant risks from financial markets spillovers for refined products such as diesel and jet fuel, particularly in the Eurozone and the UK, where energy dependence is high.

There are hints that trap door scenarios are emerging, as prices drop suddenly and aggressively when critical technical indicators are breached. In these moments, commodity trading advisors (CTAs) and quantitative hedge funds prioritize speed over fundamental supply-demand analysis. Based on high-frequency data, such as satellite images of tanker movements or real-time pipeline flow sensors, these automated systems front-run anticipated market movements. These algorithms can execute thousands of trades in milliseconds in response to geopolitical headlines, creating volatility clusters that amplify the initial shock. Mechanical behavior often leads to a decoupling where the financial price of oil diverges sharply from the physical price, posing a systemic risk to smaller exploration and production companies.

Financialization will involve the integration of artificial intelligence-driven sentiment analysis into trading engines. In real-time, these systems analyze thousands of news sources, social media feeds, and diplomatic statements. According to a study published in ResearchGate in 2025, negative news jumps have a far greater impact on market volatility than positive developments. Due to this sentiment-driven environment, the momentum of large institutional orders, further tightening the bid-ask spread, but paradoxically increasing the fragility of the market during risk-off periods. As a result of reacting to alternative data, such as changes in military positioning or changes in insurance premiums in specific maritime zones, these financial actors inject geopolitical risk into the economy well before any actual physical disruption to oil production occurs, effectively pricing in ghost disruptions to keep energy costs high.

6. Regional Divergence: Importers vs. Exporters

The economic fluctuations of 2024-2025 have not been felt uniformly. Emerging Markets have face a "double risk"—higher energy costs and a rising US Dollar, which often appreciates during geopolitical turmoil (the "safe haven" effect). While OECD Economies have shown greater insulation due to increased energy efficiency and the growing share of renewables in the power

mix. Meanwhile, exporting nations have shifted toward "disciplined capital management," prioritizing price stability over market share to manage their internal fiscal breakeven points. In 2024 and 2025, the economic divergence between oil-importing and exporting nations has been exacerbated by the emergence of a multi-tiered global market, driven largely by the proliferation of the "shadow fleet" and the bifurcation of trade routes.

A primary driver of regional divergence in 2025 is the role of the shadow fleet, which now comprises nearly 17-20% of the global tanker fleet (Atlantic Council, 2024; KSE Institute, 2025). This network of aging, often uninsured vessels has allowed sanctioned oil from Russia, Iran, and Venezuela to flow primarily toward non-aligned importing hubs like India and China. For these nations, the financial risk of geopolitical tension is paradoxically offset by the Sanctions Discount—where Urals and ESPO crudes have traded at discounts of $10 to $15 per barrel relative to Brent benchmarks throughout 2025. Research from the Kyiv School of Economics (2025) indicates that this tiered pricing system has allowed major Asian importers to maintain a competitive advantage in energy-intensive manufacturing, effectively shielding their GDP growth from the full inflationary impact of the Red Sea shipping crisis that afflicted Western importers.

Conversely, for G7-aligned importing nations, the mechanics of the shadow fleet present a significant systemic and environmental risk. Because these vessels operate outside the International Group of P&I Clubs, a major maritime accident in a chokepoint like the Danish Straits or the English Channel would leave coastal states bearing the full financial burden of cleanup. In 2025, this has translated into a new form of Policy Risk, where European nations have had to increase fiscal allocations for maritime security and emergency response infrastructure. Furthermore, as the U.S. and UK intensified sanctions on individual shadow tankers in late 2025 (Kpler, 2025), "compliant" importers faced sudden spikes in freight and war-risk insurance premiums. This has led to a widening gap in Cost of Energy between the East and West; while India and China utilized shadow logistics to dampen economic fluctuations, the EU and OECD economies faced higher logistical friction, contributing to the stickier core inflation observed in their domestic markets during the 2025 fiscal year.

7. Transition Risk: The New Geopolitical Frontier

We are expanding the definition of "geopolitical risk" to include the Clean Energy Transition as we look towards 2026. The risks associated with critical minerals (Lithium, Cobalt) are beginning to resemble those associated with the oil industry. According to IEA reports (2025), the greatest financial risk is the current underinvestment in upstream oil and gas, which could lead to supply crunches before renewable infrastructure is able to meet demand.

As the global economy pivots toward cleaner energy, traditional geopolitical risks associated with oil chokepoints-like the Strait of Hormuz-are now mirrored by vulnerabilities in the critical minerals supply chain. Based on the IEA's (2025) and S&P Global's (2025) research, green

chokepoints are created by the high geographical concentration of lithium, cobalt, and rare earth processing (primarily in China) that pose a systemic risk to the electrification of transportation. This transition presents oil and gas firms with a "Substitutability Risk"; financial stability is no longer solely dependent on oil supply, but also on the speed and security of mineral-intensive renewable infrastructure. During 2025, geopolitical tensions between the U.S. and China over battery-grade material export controls rippled through energy markets as investors hedged against a stalled transition that could paradoxically keep oil demand high for longer while simultaneously increasing the cost of capital for green-transitioning fossil fuel companies.

A second dimension of this new frontier is the $800 billion investment shortfall identified in industry reports for 2025 (OPEC; Discovery Alert, 2025). It stems from a misalignment between divestment policies driven by climate change and current energy consumption patterns. During 2024 and 2025, banks and private equity firms significantly reduced lending to upstream projects due to strict ESG (Environmental, Social, and Governance) mandates. The lack of new production capacity, however, has eroded the global spare capacity buffer due to the record high oil demand in late 2024 (EIA, 2025). A lack of capital-intensive infrastructure means that, by 2025, even minor geopolitical skirmishes will have the potential to trigger disorderly price spikes since natural field declines will no longer be replaced by capital-intensive infrastructure. The result is a dual economic risk: the immediate risk of high energy prices and the longer-term "Carbon Asset Risk," in which high-cost, underhedged projects could become stranded assets on bank balance sheets if demand drops.

8. Conclusion

The research of 2024 and 2025 suggests a paradigm shift in how we view geopolitical oil price risk. While tensions remain high, the global economy has developed more robust defense mechanisms—including strategic storage, diversified supply from the Americas, and more sophisticated financial hedging. However, the risk of black swan events remains. Future research must focus on the interplay between traditional energy shocks and the emerging vulnerabilities of the green energy supply chain to provide a truly comprehensive view of global economic stability. The collective research of 2024 and 2025 indicates that we have entered an era of "Decoupled Sensitivity," where the traditional 1:1 correlation between Middle East conflict and global recession has fundamentally weakened. As highlighted, the global economy's baseline resilience is now bolstered by a diverse non-OPEC+ supply cushion and more sophisticated strategic inventory management. However, this review identifies a critical paradox: while the probability of a traditional "oil-led recession" has decreased, the potential for "volatility-induced financial contagion" has grown. The transition from physical supply risks to high-frequency, algorithmically driven financial risks means that economic fluctuations are now more likely to manifest as sudden liquidity crises or "flash" price spikes that destabilize the cost of credit for energy-intensive sectors before physical production is ever affected.

9. Recommendation

Looking ahead to 2026 and beyond, the primary economic risk in the oil and gas sector is no longer just the "threat of closure" for a pipeline, but the "threat of exclusion" from capital markets. The widening gap between record global energy demand and a chronic shortfall in upstream investment—driven by stringent regulatory mandates and the orderly transition narrative—creates a fragile floor for global prices. As this review has synthesized, the "New Geopolitical Frontier" is one where energy security and climate goals are in a state of constant, friction-filled negotiation. For policymakers and investors, the challenge for the next decade will be managing this disorderly movement toward net-zero without triggering a series of supply-side price shocks that could undermine the very political stability required for a successful global energy transition.

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