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The Impact of Geopolitical Factors on Global Oil Prices and Supply Chain Sustainability

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ABSTRACT

Purpose: This paper assessed the effects of political stability and trade sanctions on SCSC; with references to the Russo-Ukraine war ordeal, Iranian SCSC under sanctions, and SCSC under the oil embargo. Trade restrictions, environmental policies and other regulatory factors have an impact on energy trade by increasing the volatility of the global energy market and the inefficiency of supply chains.

Methodology: In this study, secondary source of data collection was employed by extracting information from government documents, journals specializing in oil industry and academic database to evaluate the economic and policy effects of changes in the oil market.

Findings: It is found out that supply influences oil price fluctuations resulting from geopolitical crisis such as wars, trade policies and regulation initiatives, economic sanctions, piracy and terrorism, and political instability. Nonetheless, restrictions like embargoes significantly impact oil trade, hence adversely affecting supply chain operations and associated costs. Furthermore, environmental policies are altering the nature of supply chain resilience through carbon regulations, fluctuations in energy availability, and the imposition of emission capacity limitations that are disadvantageous for oil-dependent nations.

Unique Contribution to Theory, Practice, and Policy: It was suggested that both the governments and the economies which rely heavily on oil put more relaxed measures in place in an attempt to counter the challenges of the oil supply chain fundamental to the environmental as well as the trade policies. That is why future research should investigate the problems of real-time monitoring of geopolitical risks and the impact of digitalization of the oil market on a more distant outlook.

Keywords: *Geopolitical Risk, Oil Price, Energy Supply, Trade Sanctions, Energy Security*

1. INTRODUCTION

1.1 Background of the Research

The global oil market is a vital component in sustaining wealth, supporting industry, and enhancing international commerce. Nonetheless, the supply and demand of oil and stamina might be seen as pressing issues now, primarily due to uncertain geopolitical conditions. This research consequently examines several elements, including supply-demand dynamics, production policies, speculation, and political upheavals. Conversely, supply chain sustainability in the oil sector pertains to the stability and ongoing nature of the logistics that facilitate the procurement, transportation, and distribution of energy, particularly when disruptions arise from geopolitical factors (Carnazza and Cappelli, 2025). Given the efficiency and interconnectedness of energy markets, geopolitical conditions have emerged as a primary factor influencing oil prices and supply chain vulnerabilities.

The subsequent factors that affect the dynamics or condition of the oil market are as follows: Primarily, crude oil is the most vital commodity in the energy sector; hence, variations in crude oil prices influence the stability of global economies in both producing and consuming nations (Niknami, 2024). This is due to OPEC+ controlling supply via production targets and quotas, hence possessing the ability to influence pricing. External shocks, such as trade barriers, sanctions, embargoes, and geopolitical issues, have intermittently impacted energy markets, thereby influencing oil prices in economies that are entirely reliant on them (Struk and Hurnyak, 2024).

Another element of the oil market component is the transition to alternative energy sources and sustainable energy policies. Various nations have enacted policies such as carbon taxes, subsidies for renewable energy, and regulatory frameworks to diminish the reliance on fossil fuels. They present enduring hazards to oil-exporting countries due to alterations in consumer behavior patterns within global marketplaces (Yılmaz and Bozdemir, 2024). Nevertheless, crude oil remains a crucial energy source, and its logistical reserves are subject to political influences.

This study eludes that energy security is contingent upon geopolitics, including trade connections, organizational affiliations, and resource availability. Social uncertainties, political hazards, and the organization of armed forces are critical factors in the production, transportation, and marketing of oil, as noted by Madubuko (2024). Countries dependent on imported energy are expected to be substantially affected by concerns such as power conflicts, trade restrictions, or economic penalties (Wen, 2024).

Energy security refers to the assurance of a sufficient and consistent supply of oil, particularly in times of potential disruption. Currently, oil-exporting nations use their resources as geopolitical instruments, manipulating output and policies to influence market dynamics more significantly than the market itself (Nassar and Azzi, 2024). The oil-importing nation aims to diversify its oil supply sources, invest in energy infrastructure, and engage in diplomacy to mitigate risks associated with instabilities.

Given the global pursuit of more energy supplies, it is implausible to assert that geopolitical factors will exert no influence on the supply and pricing of oil. Variations in worldwide political status, along with alterations in oil production regulations and initiatives for energy resource diversification, will dictate the future trajectory of the oil market.

1.2 Problem Statement

The international oil sector encounters elements such as political risks and instabilities, trade policies, and energy regulations that influence oil prices and the entire supply chain of the oil business (Niknami, 2024). Geopolitical risk constitutes a component of market risk; hence, there are no stability considerations for either exporting or importing nations. Although various opinions exist regarding the factors influencing oil prices and the impact of geopolitics on these prices, the effects of unforeseen variables on the stability of oil prices and the configuration of the liquefied supply chain have not been addressed in previous literature (Madubuko, 2024). The current literature places considerable emphasis on short-term fluctuations due to prevalent conflicts and trading restrictions, yet there is limited attention to the ability to establish sustainable global oil supply sources amid enduring geopolitical risks (Carnazza and Cappelli, 2025).

Although numerous studies examine volatility in oil markets and its dynamics, none concentrate primarily on economic and market aspects while disregarding geopolitical influences on energy markets (Struk and Hurnyak, 2024). The literature review on political instability and wars elucidates the immediate implications of these factors on the oil market; thus, insufficient attention has been devoted to their long-term impact on supply chain sustainability (Bozdemir, 2024). Thus, trading practices, diplomatic ties, and settings have been analyzed independently as factors contributing to the volatility in oil prices and energy supply chains (Ogugbuaja and Willies, 2024).

The unpredictability in global oil markets precipitates significant fluctuations in the economic and strategic importance of countries that either export or import oil. Consequently, political instability, conflict, and trade restrictions affect fluctuations in oil output, inflation, and energy insecurity (Wen, 2024). Conditions such as the OPEC+ agreements and sanctions govern the oil supply in the worldwide market, establishing a dependency among countries, as noted by Nassar and Azzi (2024). Energy policies and environmental restrictions introduce additional risks to the supply chain, prompting governments to consider critical considerations regarding economic benefits, climate change objectives, and various connections (Struk and Hurnyak, 2024). To formulate energy policy, prepare for energy stability, assure oil price stability, and secure supply, all relationships must be comprehended.

1.3 Objectives of the Paper

- To analyze the impact of political instability and global oil prices and supply chain sustainability

- To evaluate how trade policies, sanctions, and international relations influence global oil prices and supply chain sustainability
- To examine the effects of energy policies and environmental regulations global oil prices and supply chain sustainability

2. LITERATURE REVIEW

2.1 Theoretical review

Resource Dependence Theory (RDT)

Resource Dependence Theory, formulated by Pfeffer and Salancik (1978), posits that all organizations, whether industrial entities, sector-specific organizations, or nations, necessitate external resources to operate efficiently. The theory posits that entities are unable to evade power dynamics, negotiate international trade, or mitigate risks associated with external resource-related shocks. RDT has been applied in supply chain management to assess how organizations prepare for issues that may cause disruptions in the political environment. It has also been utilized in the energy sector to assess how nations position themselves regarding energy policies in an effort to diminish their dependence on unpredictable oil-exporting countries. RDT effectively elucidates trade relationships, the establishment of economic partnerships, and policy-induced changes; yet, it fails to account for shocks that alter the spatial dynamics of oil markets. This study utilized RDT to ascertain the methods and frequency by which trade policies, market sanctions, and supply chains influenced the oil market, aimed at analyzing political stability, global oil prices, and energy transition policies.

Geopolitical Risk Theory (GRT) - Caldara and Iacoviello (2018)

The Global Risk Theory (GRT) was initially presented by Caldara and Iacoviello (2018) as an indicator of the global market's volatility stemming from political instability, violence, trade restrictions, and diplomatic difficulties. The idea is employed to compare the impacts of warfare, diplomacy, and international politics on commodities markets within the social, economic, and energy sectors. It has also been utilized in the examination of fluctuations in oil prices, where it is acknowledged that market credit, trading, and supply chain disruptions escalate with heightened geopolitical concerns. The efficacy of GRT lies on its capacity to measure geopolitical risk and allocate the resultant detrimental effects on trading and investment strategies. Nonetheless, it must be acknowledged that the theory does not invest much effort in demonstrating that market issues and crises can be resolved in the long term. In this context, GRT was employed to ascertain the correlation with the study's objectives concerning trade sanctions, energy sustainability, and economic stability in relation to political instability and trade restrictions within oil supply chains, significant oil price volatility, and the influence of the subject on the development of energy policies.

2.2 Empirical review

Political instability, global oil prices, and the sustainability of supply chains

In their study, Daghighiasli et. al., (2024) elucidated how government stability, socio-economic conditions, and geopolitical risk affected short-term crude oil prices and the supply chain of oil-exporting nations in the Middle East and North Africa, using a quantitative research design, with secondary data collected from international energy organizations, relevant websites, economic considerations, and OPEC production records, upon which regression models were applied. The result suggested that stable nations enjoyed a consistent oil supply, but unstable ones saw fluctuations and disruptions in oil prices. The report advocated for the diversification of the economies of oil-exporting nations, enhancement of energy diplomacy, and the formulation of contingency strategies regarding energy and insecurity.

Khalilnezhad and Eslamloueyan (2024) examined strategies and efforts about the stability of oil prices following geopolitical problems and the onset of COVID-19, applying Keynesian Economic Theory to analyze how government interventions influence stability in oil-dependent developing countries within the Middle East and North African (MENA) area, and qualitative assessment of change through applied research utilizing statistical methods and expert interviews to government policymakers, economists, and corporate people within the energy sector. The result turned out that nations with prudent fiscal management saw more rapid and significant recovery from declining oil prices compared to those that deteriorated financially. It is advisable for governments to disclose their accounts, increase financial reserves for emergencies, promote cross-border energy commerce, and formulate sound economic policies to address market concerns in the oil sector.

Zhao et. al., (2024) In their study article titled, ‘Does Political Instability Affect Energy Policies and Oil Prices?’ aimed to analyze the relationship among political stability, energy policies, and oil prices concerning major producers, specifically the US, China, and the EU, as well as consumers, applied cross-sectional study design to investigate political instability and regulatory changes in the oil industry from 2015 to 2024; focusing on energy regulators, oil trading firms, and policymakers. They used integrated theoretical and expert data on oil prices and found out that political discord and trade restrictions contribute to the fluctuation of oil prices by elevating supply chain risks. The report additionally advised that governments should formulate effective energy policies, strengthen trade relations, and invest adequately in stable energy sources.

Trade policies, sanctions, global oil prices, and supply chain sustainability

Niknami (2024) tested the effects of EU sanctions on Russia's petroleum sector, pinpointing trade processes, pricing, and supply chain commotions from 2022 to 2024. In light of international trade theory, the study applied quantitative methods to device the economic effects of reactive actions by means of secondary data sources such as EU trade reports, government reports, and OPEC

statistics. Studies specify that sanctions have reduced Russian oil exports, scaled up European energy prices, and routed Russian supplies into Asian marketplaces. The study suggested that European policymakers diversify energy sources, enhance trade partnerships, and de-politicize politically sensitive oil suppliers to achieve supply chain efficiency and market stability. These findings highlight the critical intersection of sanctions, trade policy, and global energy security.

Also, Zhilina et al. (2024) appraised the role of sanctions and energy disparity on the oil market of Europe and Eurasia, with interest on political and economic intricacies in resource supply. They described supply chain disruption, e.g., US-Iran embargo, through qualitative study of nationwide energy adaptation to trade embargos by use of Energy Market Equilibrium Theory. Focus was on policymakers, trade regulators, and energy-reliant industries by using skilled decision to get the views of experts, and the mined data comprised trade treaties, global energy policy, and case studies of sanctioning regions. It is found out that sanctions made oil-importing nations shift to alternative energy sources, increasing the cost of imports and changing international trade balances. Desired action are flexible trade policies, diversified energy mixes, and increased cooperation for energy security.

Meanwhile Talus (2024) scrutinized the influence of international energy regulations and sanctions on the petroleum business, value chains, and market context and conditions, with geographic focus areas in the United States, Europe, and the Middle East. Based on institutional and legal theory, the study inspected policy design in energy commodity markets and reflected on role of trade policy in influencing energy security as a doctrinal method. Pointing to policymakers, trade regulators, and industry planners, evidence was collected from sanction-related laws, trade policies, and legal documents. The result is that sanctions puts legal hurdles on oil-exporting states, which recommends new regulatory actions and preparations of law. Thus, international energy trade conventions to match new political and economic settings so as to realize market strength and energy security that is sustainable is advised.

Energy policies, global oil pricing, and supply chain sustainability

Sarkodie et al. (2025) explored the effect of biofuel policy on oil price strength and supply chain management in Ghana via Energy Policy Transition Theory to study the change from fossil fuels to renewables. The study, which was based on six years of economic data, investigated how energy policy influences oil markets in developing economies, mainly government agencies, energy sectors, and renewable investors through purposive sampling. Policy steps, reports, and macroeconomic indicators' figures were surveyed in regression models besides content analysis. Results indicate that biofuel policy can alleviate oil prices locally as well, rally investment to fuels spawned with renewability. Thus, regional support, global promotion of biofuels, and green energy regime-building to strengthen chain markets and strengthen energy security is required.

However, Ahani and Dadashpoor (2025) studied performance of energy policy in Tehran under oil demand, price fluctuations, and supply management, using the Spatial Energy Economics

Theory and Grounded Theory technique, they hypothesis-tested the level to which policy by government, infrastructure, and urban planning impacts oil use. Urban planners, energy experts, and regulators were the target of sampling, upon which reliance on government reports, municipal energy policy plans, and expert interviews depended. Results showed that eco-friendly urban energy policies improve general supply chain long-term efficacy but unreliable policy realization causes short-run commotions. In their approval, the authors endorse promoting energy conservancy, presenting severe regulations to metropolitan cities, and upholding green energy sources as a means to enhance stable provision and long-term sustainability in urban energy.

Consequently, Li (2024) studied China's oil price and supply chain steadiness with emphasis on energy policy, subsidies, and policy variation based on Macroeconomic Energy Market Theory. Applying quantitative approach, the study explored the government's intrusion in oil pricing and its influence on market stability. With energy policymakers, economists, and corporate planners constituting target audience, the data were mined built on a systematic sample approach and analyzed through time series econometric models. Studies pointed that while subsidies alleviate domestic oil prices, they dislocate supply chains and sway global market volatility. The study recommended developing multidimensional policy and directed investment in green energy to safeguard a bearable transition, shaping long-term stability in the Chinese energy industry and decreasing dependence on instable oil price apparatuses.

2.3 Evaluation of Current Literature

Scholars and researchers have conducted studies to understand the impact of geopolitical threats on global oil markets; nonetheless, several gaps have been observed. There is a deficiency of conceptual studies, as the majority of research focus on short-term issues, such as conflicts and sanctions, which affect oil price fluctuations and supply chain risks, neglecting long-term consequences (Niknami, 2024). Additionally, there are apprehensions about the association between certain energy security measures and minor regional conflicts, which may contribute to the volatility of oil prices.

Fundamentalist methodologies are employed for oil price forecasting; nevertheless, while they estimate prices based on supply-demand theories, they are frequently influenced by political issues in numerous instances (Li et al., 2024). Some models indicate that price direction is influenced by adjusted OPEC production, while others contend that price swings are driven by speculation. This volatility adversely affects the policies governing the development processes of oil-importing nations, as indicated by the findings of Sarkodie et al. (2025).

Nonetheless, supply chain sustainability frameworks are not without issues, as several studies focusing on these frameworks predominantly prioritize logistics and infrastructure over policy intervention (Ahani and Dadashpoor, 2025). The impact of trade sanctions, energy transition policies, and carbon taxes on the long-term supply prospects of oil has been insufficiently examined in study. Future study may focus on the advanced development of geopolitical,

comparative, economic, and trade policy frameworks to investigate the sustainability potential within the oil market.

Contextual Discrepancy, Methodological Discrepancy, and Theoretical Discrepancy

Prevailing research on oil markets emphases on gigantic Middle Eastern, Russian, and North American manufacturers at the cost of the economic bearing on African, Latin American, and Asian oil-importing realms (Niknami, 2024). Moreover, studies have a propensity to relate econometric regression models to estimate oil prices without respect to unending geopolitical proceedings and policy changes (Li, 2024). Major studies are alarmed with supply and demand factors while disregarding the role of political instability, environmental policies, and energy security mechanisms (Sarkodie et al., 2025; Ahani and Dadashpoor, 2025). Thus, to address these deficiencies, this research syndicates Geopolitical Risk Theory, Resource Dependence Theory, and environmental policy paradigms to offer a more comprehensive opinion of the sustainability of the world oil market and the dynamic trade system.

3. METHODOLOGY OF RESEARCH

3.1 Research Methodology

This research employed secondary analysis, evaluating literature, reports, studies, and data concerning geopolitical threats, global oil prices, and supply chain sustainability. Desk research was suitable as it included compiling several studies, policies, and reports previously conducted by other researchers, governments, and industries, along with doing a review. The selected methodology allowed the research to leverage historical oil price trends as a benchmark for identifying price patterns and to incorporate real-time analytical insights regarding specific geopolitical events and the energy policy environment, which would have been more suitable compared to alternative methodologies (Baig et al., 2022).

3.2 Methods of Data Collection

This research employed solely a secondary research method, utilizing data from numerous academic databases, research reports, government publications, etc., to assess the influence of geopolitical threats on oil prices and the supply chain. Consequently, the subsequent datasets pertaining to access to professional articles, dissertations, and conference papers were utilized in relation to energy regulations, trade restrictions, and supply chain disruptions.

Additionally, secondary sources like the IEA's annual report, OPEC annual report, EIA, and World Bank were utilized to assess petroleum output, market fluctuations, policies, and pricing (Islam et al., 2024). Papers published prior to 2022 were excluded for failing to meet the criterion concerning the geopolitical influences on energy markets. Furthermore, papers that contained hypotheses, biased data, or limitations in methodological rigor were disregarded. This facilitated the

examination of the work against the most recent data and policy-oriented literature in the specific domain.

This study employed thematic and comparative analyses to examine qualitative findings regarding geopolitical threats, fluctuations in oil prices, and supply chain vulnerabilities. Furthermore, the comparison was conducted to analyze the geopolitical impact on diverse regions, their economies, and the energy industry. This approach offered further context on the variations and disturbances in pre- or post-crisis oil pricing and supply chain logistics, grounded in policies (Su et al., 2021).

3.3 Constraints of the Research

This research was based on secondary data and so its validity depended on the original writers, and while supportive in market and historical context, is not accurately illustrative of existing geopolitical transferals in oil supply. To add on, political unrest, evolving energy policies, and technology augment fluctuating long-term effects, which demands ceaseless revision and dynamic estimates in follow-up studies.

4. RESULTS AND DISCUSSION

4.1 Influence of Political Instability on Oil Prices

Conflicts, Sanctions, and Price Fluctuations (Case Studies: Russia-Ukraine, Iran Sanctions)

War, economic sanctions, and other factors that disrupt the supply and demand equilibrium of oil are classified as political risks. The initial two rises were ascribed to the Russia–Ukraine conflict that commenced in 2022, resulting from supply chain disruptions, rapid sanctions on Russian oil exports, and energy volatility in Europe (Nassar and Azzi, 2024). In this dispute, Western nations restricted Russia's access to sell its oil through preferred channels, including China and India, resulting in a market shift in Europe (Van de Graaf, 2023). The numerous consequences of European and American sanctions on Iran's oil industry are evident in elevated oil prices and trade restrictions, which have compelled Iran to become an oil dealer, particularly with allies such as China. Their actions have impacted the limited supplies, the speculations, and the market instability that was apparent during the previous lockdown of the most prominent oil-exporting nations (Olisah et. al., 2024).

Additionally, market expectations and risk differentials typically result in an increase in oil prices during instances of political instability. Following the invasion of Ukraine by Russia, Brent crude oil prices surged above $120 per barrel, marking a period of significant volatility (Volynets, 2024). This was attributable to an unpredictable future energy landscape constraining Russian production capacity, alongside anticipated volatile global oil prices. Additionally, OPEC+'s policy initiatives concerning output led to price volatility, as the cartel sought to regulate global supply in response to varying demand influenced by geopolitical and other factors (Maghdid et. al., 2023).

Effects of Coups and Political Turmoil on Supply Chain Logistics

Political coups and local market uncertainty in OIP (Overall Increase and Production) nations undeniably impact the supply chain, pricing, and investment outflows. Disruptions in oil delivery across African nations, including Sudan and Libya, have been impeded by various factors associated with military intervention and transportation risks (Engebretsen, 2022). For example, concerns regarding the security of energy infrastructure have emerged following the 2023 coup in Niger, as it is integral to the West African oil pipeline systems (Yılmaz, 2023).

Similar to the aforementioned situation in Venezuela, this nation is undergoing political turbulence that has resulted in significant mismanagement, diminished investment, and reduced oil output due to sanctions and civil unrest. The issues are defined by the nationalization of oil businesses and politically unstable relations with Western nations, which have impeded infrastructure investment, so constraining supply chains and limiting export potential for expansion. Moreover, political instabilities in regions such as Iraq and Syria have adversely affected transportation links to other places, hence increasing operational costs for refiners and traders (Sielker and Dannenberg, 2025).

A critical element of a turbulent supply chain is the threat to the security of trade routes, together with the limitations arising from instability inside specific countries. Particular risks linked to supply routes encompass piracy and terrorism, notably in the Straits of Hormuz, Red Sea, and Gulf of Guinea, which have historically endangered transit through these regions, thereby increasing transportation and insurance costs for oil supply. These interruptions impact the reliability of nations that consistently deliver oil, a feature that intensifies market price volatility.

Politics is a significant element influencing international oil pricing and the reliability of the supply system. Political dynamics, economic conditions, warfare, economic sanctions, and the recent political coup influence supply chains, thus heightening the price volatility of commodities. Currently, Russia's invasion of Ukraine, sanctions on Iran, and coups in Africa exemplify how political instabilities affect oil supply inventories, recalibrate energy market prices, and reshape investments in energy security. Addressing these geopolitical concerns necessitates the implementation of more adaptable energy strategies, diverse supply sources, and enhanced buffer policies, as the repercussions of political disruptions on the oil market could be catastrophic.

4.2 Trade Regulations and Oil Supply Chain

Impact of OPEC+ Agreements on Price Stability

The OPEC and its allies, commonly known as OPEC+, play a crucial role in regulating and stabilizing oil supply in the global market. OPEC+ agreements also emphasize supply allocations to ensure oil price stability amid demand fluctuations and geopolitical factors (Taghizadeh-Hesary et. al., 2023). Proposed OPEC+ limits for this year and the next are certain to elevate prices, so confirming the mechanical impact of supply-side measures on global market stability (Vandyck et al., 2023).

OPEC+ moderates the extent of production adjustments to enhance demand and supply stability, so addressing both declining and surging oil prices (Hajiyev et. al., 2023). However, their geopolitics leads to members not rigorously adhering to market quotas, resulting in increased risk. In early 2023, Russia provided a partial uncertainty to the OPEC+ perceptions, so doubting the unity of the new cooperative framework and inducing short-term price instability (Roeben, 2024).

The current economic sanctions imposed on several member countries, including Iran and Venezuela inside OPEC+, consistently disrupt market supplies (Ibrahim, 2023). Even fossil fuel organizations like OPEC are affected by the Paris Climate Agreement, which diminishes long-term demand for fossil fuels owing to the transition to sustainable energy. These dynamics illustrate the equilibrium that OPEC+ must attain to establish a sustainable oil price, which is influenced by both demand and geopolitical factors.

Effects of Trade Restrictions and Embargoes on International Oil Commerce

Trade policies, sanctions, and the establishment of embargoes significantly influence global oil markets and the wider economy. Authoritarian governments utilize oil export and import prohibitions and quotas as geopolitical instruments, affecting energy accessibility, availability, and price stability (Zhang et al., 2023). Western nations implemented sanctions following the Russia-Ukraine conflict, which necessitated a reconfiguration of maritime oil trade and concurrently elevated oil prices throughout 2022 (Vandyck et al., 2023).

The United States similarly constrained Iran and Venezuela's capacity to sell its crude oil through normal international market routes, compelling them to associate their oil with secondary and tertiary entities such as China and India (Roeben, 2024). Similarly, the EU's policy to progressively reduce the importation of Russian crude oil and oil products has intensified rivalry in the quest for alternative oils in the global market, hence affecting oil price ranges (Farah and Cima, 2024).

Likewise, the policies of exporting nations, including oil-exporting countries like Saudi Arabia and the UAE, have further constrained the supply chain due to geopolitical challenges and economic limitations. This encompasses transportation expenses and insurance fees for crude oil, along with storage costs, which have further increased the financial burden on global refiners and customers (Ibrahim, 2023).

However, these trade policies possess politico-geo-economics repercussions rather than only addressing 'price volatility concerns' over long-term energy supplies and associated hazards. Oil-importing nations are diversifying their energy sources by augmenting investments in renewable energy, innovative cooperation, and supply chain management (Taghizadeh-Hesary et al., 2023).

OPEC+ and protective measures significantly influence the structure of oil supply and pricing. OPEC+ aims to regulate oil production to stabilize prices; nevertheless, trade relations, policies, and prohibitions counteract this objective. The relationship between oil-exporting nations and their obligatory Western consumers, characterized by the fear of war and sanctions, and the ongoing

pursuit of resource and market diversification, underscores the unique nature of the industry. In the future, these policies should aim to ensure energy demand and bolster economic stability, considering the supply of oil and resource availability amid uncertain global politics.

4.3 Sustainability Challenges in Energy Supply Chains

Regulatory Obstacles Impacting Supply Chains

The energy supply chain faces significant regulatory risk stemming from government regulations related to emissions trading and energy generation. The unpredictability in the energy sector and politics has led to goal incongruities, contractual issues, and disruptions in the oil markets (McKinsey and Company, 2025). Carbon taxes, emission reduction regulations, and renewable energy mandates diminish the competitiveness of traditional fossil fuel supply chains in the market (Lavanya, 2024). The EU's carbon border adjustment mechanism (CBAM) levies tariffs on imported commodities with high carbon emissions, hence altering the geography of complex energy supply chains (Kirnats et. al. 2024).

It also raises the subject of the evolving dynamics in the relationship between resource-rich countries and others. Russia and Iran face challenges in exporting, reducing, or regulating pricing, which impact their supply chains and necessitate engagement with markets beyond the Western world (Fathi et al., 2024). The expense of adhering to efficiency standards or clean fuel regulations imposes an additional strain on oil producers, hence impacting trade balance and supply chain flexibility. These concerns underscore the necessity for energy-dependent economies and corporate entities to adapt in relation to market supplies.

Environmental Policies Altering Market Dynamics

Recent economic shifts and energy resource consumption have reaffirmed environmental sustainability as the primary driver of the energy supply chain. Currently, the government and international agencies are actively promoting the transition from fossil fuels to renewable energy in response to climate change (Lavanya, 2024). Policies such as the Paris Agreement, carbon neutrality, and the utilization of renewable energy sources are compelling oil-dependent economies to transition from the conventional oil supply chain business model (Kirnats et al., 2024).

Market behavior may also shift due to investor actions and the rising consumer demand for green energy. Institutional investors and multinational corporations are increasingly moving away from traditional energy sources and prioritizing sustainable supply chain models that are environmentally friendly and compliant with legal standards (Fathi et al., 2024). Consequently, there has been a prolonged pattern of flat or negative investment in new fossil fuel production capabilities, raising several worries over the sustainability of oil supply in international markets. Moreover, contemporary energies are being utilized by energy companies, including Blockchain and intelligent AI-driven supply chain and carbon tracking systems (Agostinho and Zucaro, 2025).

Simultaneously, appropriate regulations can address certain pricing or organizational/instrumental elements in the physical shift to climate-friendly energy systems. The sluggish growth of renewable energy markets has resulted in a limited stock of intermediate suppliers, hence affecting the volatility of energy and oil prices. Concerning the future dynamics of energy security, sustainability is a crucial component, and the unpredictable regulatory changes have resulted in the diversification of the energy industry.

Regulatory variables and policies significantly influence sustainability issues in the energy supply chain. Energy transformation sources arise from climate policies aimed at eliminating carbon emissions, but long-term energy transition processes present several hazards, costs, and disruptions to supply chain management. This paper examines the comprehensive impacts of the transition to green energy, including alterations in the market, investment, management, and global trade. Authorities and industry leaders in supply chain management must implement measures to ensure energy security while also achieving sustainability objectives.

4.4 Comparison of Findings with Existing Research

Consistency or Discrepancies with Prior Research

Consequently, the study aligns with prior empirical research indicating that geopolitical concerns significantly affect oil prices and, consequently, the viability of maintaining and sustaining supply chains. Previous studies indicate that wars and sanctions result in price increases and affect the supply of oil in the global market, alongside contributing to political instability (Ngo et. al., 2024). For example, research regarding the implementation of Russia's oil ban and the sanctions imposed on Iran and Venezuela is supported by other studies that assert that supply chain repercussions and price volatility are the outcomes of sanctions (Su and Umar, 2021).

Nonetheless, it is essential to acknowledge certain disparities in the perception of geopolitical concerns that may impact the long-term stability of the oil market. Initially, it was demonstrated that OPEC+'s efforts to sustain or stabilize prices were effective; however, further evidence revealed that self-interested conflicts have undermined oil supply coordination among OPEC+ countries (Ali et al., 2024). This study refutes previous claims by scholars that investment in renewable energy would rapidly reduce fossil fuel consumption, citing constraints such as infrastructural and political barriers that impede energy transition (Trabelsi et al., 2023).

Furthermore, studies conducted on geopolitical hazards do not investigate the cumulative consequences of many dangers occurring concurrently. Previous studies examining the direct effects of geopolitical crises on oil supply and prices typically focus on a singular crisis, such as the oil price decline in 2014 or the Russian invasion of Ukraine in 2022. However, this research suggests that the presence of multiple concurrent crises significantly complicates the prediction of fluctuations in the supply chain and oil prices (Wang et. al., 2024). Political instabilities, potential sanctions, conflicts in oil-producing regions, an unstable global political climate, and volatile oil

prices create risks in energy pricing, hindering businesses and governments from accurately forecasting energy costs. Future policy and strategic implications.

Thus, the proposed policy recommendations can be regarded as novel concepts aligned with previous research, wherein Pomerleano emphasized the necessity of reforming governmental interventions essential for bolstering the supply chain and energy market. Contemporary political leaders employ sanctions, temporary trade obstacles, and shuttle diplomacy as instruments of foreign policy to fulfill their nation's short-term foreign policy objectives (Gemechu and Sonnemann, 2024). Consequently, the study's findings indicate that addressing the deficiencies of conventional analytical methods, typically employed to assess the likelihood of wars, sanctions, and fluctuations in economic stability, necessitates a focus on real-time monitoring of geopolitical risks as a viable solution.

One aspect is the change in perspective regarding the reliability of the Organization of the Petroleum Exporting Countries (OPEC+) in maintaining oil price stability. Future research indicates that OPEC+ ought to adopt a more effective and less constrictive strategy for production limitations, as opposed to the output ceiling, which may not align with prevailing market trends (Helbig and Gemechu, 2024). Countries must also construct infrastructure that supports the creation and utilization of renewable energy while ensuring a reliable supply of fossil fuels for the foreseeable future (Qin et. al., 2023).

Consequently, political oversight of the energy trade must be diminished to enhance long-term sustainability. This is due to the fact that policymakers utilize a mechanism referred to as economic sanctions to govern global trade, a policy that influences energy supply and market prices, as noted by Lee et al. (2021). They should also enhance collaboration and coordination regarding trade policies to mitigate the detrimental effects of economic sanctions and escalating political tensions.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The study established that supply influences oil price fluctuations resulting from catastrophe such as war, trade sanctions, and political instability; by considering Russia-Ukraine conflict, Iranian sanctions, and OPEC+ to demonstrate how economic and political interventions upsets oil market variations. Even so, limitations like embargoes considerably impact oil trade, hence poorly affecting supply chain processes and associated costs. Besides, environmental policies are shifting the nature of supply chain pliability over carbon regulations, fluctuations in energy disposal, and the imposition of emission capacity limits that are disadvantageous for oil-dependent countries.

5.2 Recommendations for Policy and industry

Governments have to work out appropriate energy security strategies to battle geopolitical risks in contradiction of oil prices, meanwhile oil companies should improve logistics and broaden their

supply networks horizons, beside with universal efforts in renewable power practice, infrastructure investment, and open rules to withstand market stability.

There is a necessity for a greater volume of research centered on real-time geopolitical risk analysis to enhance current methodologies for projecting oil market stability. Further research is necessary in the domain of digital transformation in oil trading, specifically regarding the applicability of intelligent technologies such as Artificial Intelligence, Blockchain, and Big Data Analytics in managing supply chain risks. Future research may investigate the impact of geopolitical conflicts on the development of environmental policies concerning a nation's energy security and economic stability. These insights might be advantageous for both the government and business professionals to enhance their understanding of the evolving energy industry landscape.

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