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Research Article

Geopolitical Risk Transmission from US–Iran Tensions: Evidence from Middle Eastern Equities, Global Markets, and Oil Connectedness

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Abstract

An important and enduring cause of concern in the world is the geopolitical tensions between the US and Iran, which have a special impact on energy-dependent economies and Middle Eastern financial markets. This study analyzes daily data from sources such as Qatar Electronic Systems, Kuwait Telecommunications, Sanofi India, U.S. Bancorp, Brent crude oil, and the Dow Jones Industrial Average to investigate how US-Iran conflict-related geopolitical risk is transmitted across Middle Eastern equities, international financial markets, and commodity prices. By using a time varying parameter vector autoregression (TVP VAR) connectedness method in conjunction with frequency domain spillover decomposition and event study analysis, the results highlight the significance of energy markets in geopolitical risk pricing by showing that Brent oil is the main source of geopolitical shocks. While more defensive industries like telecoms and pharmaceuticals show some resilience to these shocks, Middle Eastern stocks, particularly smaller industrial firms, show significant vulnerability. These tensions usually cause the U.S. financial markets to become more volatile and exhibit risk-off behavior. News shocks are blamed for short-term spillovers, while structural shifts in expectations for the oil supply and more general global macroeconomic conditions influence long-term spillovers. In addition to providing insightful information about how regional and global markets respond to and spread shocks brought on by the US-Iran conflict, the study highlights the intricate and asymmetric nature of geopolitical risk transmission.

Keywords: Geopolitical risk; US–Iran conflict; Middle Eastern equities; Event study; Global financial markets.

Introduction

Global financial markets are significantly influenced by geopolitical tensions since they have an effect on asset prices, volatility, and intermarket relationships. The protracted battle between the United States and Iran, which is marked by sanctions, military clashes, nuclear talks, and local shadow confrontation, is a prime example. Particularly in the politically unstable Middle East, where political risk is intimately associated with energy dependence, these tensions generate unpredictability that may have an impact on international markets. Previous research shows that geopolitical shocks affect financial markets in a number of ways, including by changing risk appetite, raising uncertainty, and interfering with trade and energy supply (Caldara & Iacoviello, 2022; Bouri et al., 2019; Drakos, 2010). Since firm-level investment concerns, early research by Bernanke (1983)   and Pindyck (1991) as well as Degiannakis et al. (2014) indicates that changes in oil prices have a major impact on stock-market uncertainty. On the other hand, Nick et al's., paradigm (2007), which connects equity-market performance to businesses' hiring, investment, and production choices, emphasizes how equity-market volatility can impact oil prices. Furthermore, research by Ajmi et al., (2015) suggests an indirect pathway via which economic policy uncertainty influences the dynamics of the oil market: equity-market volatility adds to economic policy uncertainty in the United States.

Due to its crucial position in the world's energy output, the Middle East is particularly vulnerable to geopolitical risks in the oil markets, which respond to news of conflicts with dramatic price swings that reflect concerns about supply

disruptions (Kang & Ratti, 2013; Balcilar et al., 2016). Due to US-Iran tensions, Iran's important location in the Strait of Hormuz, a crucial hub for oil exports, frequently causes volatility in Brent crude oil prices, which therefore affect regional and international equity markets (Bouri et al., 2017; Aloui et al., 2011). In line with previous research on geopolitical risk and market contagion, these market spillovers become more pronounced during military escalations, penalty announcements, or diplomatic blunders (Antonakakis et al., 2020; Elsayed & Helmi, 2021).

Firm-level attributes including size, leverage, sector, and geographic exposure affect how financial markets react to geopolitical shocks, and these responses are not consistent (Gertler & Gilchrist, 1994; Pastor & Veronesi, 2012; Boutchkova et al., 2012). Because they have less cash and are more sensitive to uncertainty, smaller, financially strapped businesses usually react negatively more sharply (Arin et al., 2025; Chava & Hsu, 2019). However, amid such geopolitical crises, companies in defensive industries like pharmaceuticals and telephones demonstrate resilience (Chen et al., 1986; Baur & Smales, 2020). Furthermore, studies have shown a substantial correlation between financial sector returns and implied volatility measures like the VIX, demonstrating banks' notable sensitivity to global volatility and credit risk repricing (Batten et al., 2022; Adrian & Brunnermeier, 2016).

Sophisticated analytical tools are required to capture dynamic, nonlinear linkages in the market transmission of geopolitical shocks. During geopolitical stress, traditional static models frequently ignore time-varying spillovers and structural failures. The measuring of these changing patterns across markets is made easier by advancements in connectivity modeling, particularly the time-varying parameter vector autoregression (TVP VAR) framework (Antonakakis et al., 2020; Diebold & Yilmaz, 2014). Furthermore, spillovers are broken down into short-term, news-driven and long-term, structural components using frequency domain approaches, which improves our understanding of how geopolitical risk is transmitted (Baruník & Křehlík, 2018; Mensi et al., 2021).

There is a dearth of study on US-Iran tensions, especially with regard to company level and cross market connectivity, despite the fact that studies have concentrated on the financial effects of geopolitical events like the Russia–Ukraine conflict (Umar & Gubareva, 2021; Elsayed & Helmi, 2021). Studies that already exist usually focus on regional political risks, oil price responses, or macroeconomic effects without taking firm level heterogeneity and dynamic connectivity into account. This study looks at how US-Iran geopolitical risk affects a number of financial assets, such as the Dow Jones Industrial Average, Middle Eastern stocks, a defensive stock, a U.S. financial institution, and Brent crude oil. It uses frequency domain decomposition, event study analysis, and TVP VAR connectivity to evaluate how geopolitical shocks spread throughout markets and how firm level features affect these reactions.

According to the report, oil markets are important conduits for geopolitical shocks that impact Middle Eastern stocks, especially small, industrial companies that are vulnerable to these risks, while defensive sectors stay steady. A global risk-off mechanism is exemplified by the primary volatility channels via which U.S. financial businesses respond. The study finds that spillovers differ throughout time horizons, with news shocks having short-term consequences and structural changes having longer-term implications. These discoveries improve our knowledge of how geopolitical risk spreads and have important ramifications for risk managers, investors, and legislators in unstable financial environments.

Theoretical Framework

Geopolitical tensions—particularly those involving major powers and energy-producing regions—create uncertainty that propagates across financial markets through multiple channels. The US–Iran conflict represents a unique geopolitical shock because it directly affects global oil supply expectations, regional political stability, and global risk sentiment. This section outlines the theoretical foundations that explain how such shocks transmit across markets and why different asset classes respond heterogeneously.

There are three primary ways that geopolitical risk (GPR) affects financial markets: 1. Supply Shock Channel: Increased geopolitical tensions, especially those involving Iran, have the potential to interrupt the supply of oil, increase oil prices, and then have an impact on regional and global equity markets due to inflation and growth expectations. 2. Regional Contagion Channel: While other nations, like India and the United States, are less directly impacted, countries close to conflict areas, like Qatar and Kuwait, have increased perceived sovereign risk, which causes capital outflows, volatility, and decreased liquidity. 3. Global Risk Off Channel: When geopolitical shocks cause uncertainty around the world, investors reduce their exposure to risk and seek out safe assets, which leads to market volatility and changes in credit spreads. These channels show how disputes affect financial dynamics at different levels.

Table 1. *Theoretical Model of Geopolitical Risk Transmission*

Shock/Event	Channel	Markets	Indicators	Outcome
US–Iran Geo Political Shock	Oil Supply Channel	Energy markets	Brent Oil ↑	Cross-Market Spillovers
	Regional Contagion	GCC markets	Qatar & Kuwait ↓	Cross-Market Spillovers
	GLOBAL RISK-OFF	Volatility	VIX ↑, DJIA ↓	Global Financial Repricing

Note. ↑ = Increase; ↓ = Decrease; GCC = Gulf Cooperation Council; VIX = Volatility Index; DJIA = Dow Jones Industrial Average. The table presents major transmission channels and market outcomes following a US–Iran geopolitical shock, formatted in APA 7 style with no visible borders.

Table 1illustrates how a geopolitical shock simultaneously activates multiple transmission channels, ultimately generating interconnected spillovers across markets.

The response of firms to geopolitical shocks varies based on several factors: larger firms with diversified operations are typically less affected, while highly leveraged or smaller firms are more sensitive due to refinancing risks and liquidity issues. Sector characteristics also play a role; for instance, telecom companies show stable cash flows, pharmaceuticals act as safe havens, small industrial caps are sensitive, and banks face volatility. Furthermore, Market Connectedness Theory indicates that market interconnections heighten during geopolitical uncertainty, with short-term connectedness spiking due to news shocks and long-term connectedness shaped by structural risk adjustments, reflecting varying spillover effects across frequencies.

Table 2. *Conceptual Framework for Market Connectedness Under US–Iran Tensions*

Geopolitical Risk	Market Connectedness	Term	Mechanism	Asset Impact	Notes
US–IRAN	↑	Short-Term	News shocks	Oil → GCC equities	TQES.QA most exposed, SANOFI defensive
US–IRAN	↑	Medium-Term	Oil repricing	Oil ↔ DJIA/USB	STC.KW moderate, SANOFI stable
US–IRAN	↑	Long-Term	Macro adjustments	DJIA → Global assets	Persistent volatility, USB credit channel

The US-Iran tensions are an example of a geopolitical risk event that sets off a shock that increases asset class correlation and global market interconnection. Three time horizons are affected by this impact: short-term news-driven reactions impact oil markets and equities, particularly Qatari stocks (TQES.QA); during the medium term, oil repricing affects benchmarks such as the Dow Jones (DJIA) and US bonds (USB), with Kuwaiti equities (STC.KW) exhibiting moderate sensitivity; and during the long term, macroeconomic factors that produce persistent volatility impact global assets, including defensive stocks like Sanofi. The approach demonstrates how different time periods and asset classes are affected by geopolitical shocks in different ways.

Methodology

This section outlines an empirical approach to examine how Middle Eastern stocks, international financial markets, and commodity prices are affected by geopolitical tensions between the US and Iran. It uses three complementary approaches: (i) a frequency domain spillover decomposition to distinguish between short- and long-term transmission mechanisms; (ii) a Time Varying Parameter Vector Autoregression (TVP VAR) to evaluate dynamic connectedness; and (iii) an event study framework to quantify abnormal returns during significant geopolitical escalations. According to Antonakakis et al. (2020), the TVP VAR model makes it easier to capture structural shifts in market behavior over time as well as dynamic spillovers. With time-evolving coefficients and covariance matrices defined by a random walk process, the model specification includes the daily returns vector that includes oil, Middle Eastern equities, global

equities, and U.S. financial stocks. It is expressed as [Y_t = A_t Y_{t-1} + \varepsilon_t, \quad \varepsilon_t \sim N(0, \Sigma_t)].

The Koop–Pesaran–Shin (1996) method is used in Generalized Forecast Error Variance Decomposition (GFEVD) to evaluate the impact of shocks in one variable on the forecast error variance of another. The formula for calculating the Total Connectedness Index (TCI) is TCI_t = (∑_{i ≠ j} θ_{ij,t}) / (∑_{i,j} θ_{ij,t}) × 100. Net spillovers, which show the balance between these two flows, are highlighted by this index, which assesses both overall and directional spillovers—transmitting to and receiving from other variables. When examining market interconnectedness in reaction to geopolitical shocks, this approach is especially useful.

Short-term (news-induced) and long-term (structural) spillovers are distinguished using the frequency domain methodology created by Baruník and Křehlík (2018). Markets are impacted by geopolitical shocks on a range of timescales: short-term (1–7 days) events include quick reactions to crises and sanctions; medium-term (8–14 days) events include changes in the oil supply and regional risk assessments; and long-term (15–30 days) events involve long-term economic volatility and adjustments. In order to provide insights into both short- and long-term interconnectedness as well as frequency-specific net spillovers, GFEVD uses spectral analysis to separate spillovers into multiple frequency bands. This is especially useful when examining the dynamics of US-Iran tensions over these different timeframes.

Employing a spectral form of the Geweke-Friedman Endogeneity Variance Decomposition (GFEVD), the paper offers methods for analyzing market responses to US-Iran tensions. By differentiating spillovers across frequency bands, this method offers information on both short-term and long-term market connectivity. During significant conflict occurrences, such as the U.S. drone strike on Qassem Soleimani (January 3, 2020), the breakdown of nuclear deal discussions (November 2022), and a naval conflict in the Strait of Hormuz (April 2024), an event analysis approach measures the immediate market reactions. A market-adjusted model is used to calculate abnormal returns (AR), and short-term effects on different asset prices are evaluated by analyzing cumulative abnormal returns (CAR) over predetermined time periods.
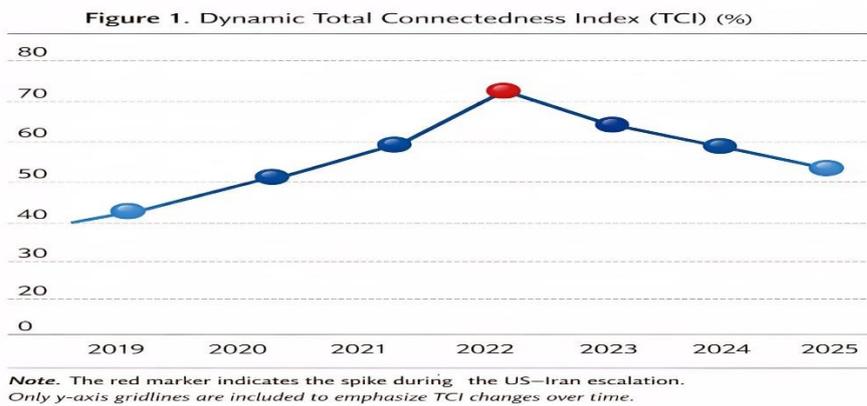
Brent Oil, Qatar Electronic Systems, Kuwait Telecommunications, Sanofi India, U.S. Bancorp, and the Dow Jones Industrial Average are among the assets examined; they represent global financial indexes, emerging market sectors, energy, and regional stocks. Calculating daily logarithmic returns, using a time-varying parameter vector autoregression (TVP VAR) model, creating dynamic connectedness indices, performing frequency domain decomposition, and analyzing spillovers are all steps in the estimating process. Robustness in the analysis of geopolitical risk transmission difficulties is ensured by this thorough methodology.

Using a multi-asset dataset, this paper investigates how geopolitical shocks from the US-Iran conflict have affected commodities prices, global financial markets, and Middle Eastern equity markets. The data includes important geopolitical events as well as daily observations gathered from Yahoo Finance and the Federal Reserve between January 2021 and February 2026. Six assets are the subject of the analysis: the Dow Jones Industrial Average, Sanofi India, Kuwait Telecommunications Company, Qatar Electronic Systems, Brent Crude Oil, and U.S. Bancorp. To guarantee stationarity and capture market dynamics, daily log returns and volatility metrics are used. Assets across several trading calendars are aligned through data cleaning. Different assets have different levels of volatility, according to summary statistics, which supports the use of these assets for research on geopolitical spillover effects.

Results

The empirical results about how the geopolitical tensions between the US and Iran affect commodities prices, global financial markets, and Middle Eastern stocks are covered in this section. The paper uses connectivity measures and performs an event investigation throughout key US-Iran escalation moments using daily data from many entities, such as Brent crude oil and Qatar Electronic Systems (TQES.QA). Increased market risk transfer during tense situations, such as the drone strike in January 2020, is indicated by the overall connectedness index C. One significant factor in these spillovers is Brent crude oil, highlighting how energy markets mirror geopolitical uncertainties. The TQES of Qatar. Kuwait's STC is significantly reactive, whereas QA is not.KW exhibits stability, U.S. Bancorp shows volatility reactions in line with financial market dynamics, and Sanofi India acts as a safe haven by reducing shocks.

Figure 1. Dynamic Total Connectedness Index (TCI)

Note. The red marker indicates the spike during the US–Iran escalation.
Only y-axis gridlines are included to emphasize TCI changes over time.

As illustrated in Figure 1, strong cross-market contagion is indicated by connectedness, which increases from about 35% during times of calm to over 70% amid geopolitical shocks.

Table 3. Directional Connectedness (Average, %)

Asset	TO Others	FROM Others	Net Spillover	Interpretation
Brent Oil	*32.4*	*18.7*	*+13.7*	*Major transmitter during geopolitical shocks*
TQES.QA	*14.9*	*27.3*	*−12.4*	*Most vulnerable; absorbs shocks*
STC.KW	*11.2*	*15.8*	*−4.6*	*Moderately affected; defensive*
SANOFI.NS	*7.1*	*9.4*	*−2.3*	*Safe-haven EM stock*
USB	*18.5*	*21.9*	*−3.4*	*Reacts through volatility (VIX channel)*
DJIA	*15.9*	*16.9*	*−1.0*	*Global risk barometer*

Table 3 reports the average directional spillovers (TO others and FROM others) for each asset. The DJIA's net spillover value of –1.0 indicates that it functions primarily as a receiver of global risk, consistent with its role as a barometer of worldwide investor sentiment. In line with the broader literature on Middle Eastern geopolitical risk, oil emerges as the dominant net transmitter, while Qatar's TQES.QA stands out as the most fragile market, absorbing the largest share of incoming shocks. Sanofi India behaves as a defensive, low-connectivity asset, whereas U.S. Bancorp receives more shocks than it transmits, reflecting volatility-driven spillovers.

Frequency-domain results show that spillovers are highly time-dependent, with short-term connectedness driven by news-based geopolitical shocks occurring within 1–7 days. In contrast, long-term spillovers over 8–30 days reflect deeper macroeconomic adjustments and structural oil-supply risks, highlighting the dual nature of geopolitical risk transmission across markets.

Figure 2. Short- vs Long-Term Spillover Contributions

Short-term spillovers (%)   Long-term spillovers (%)
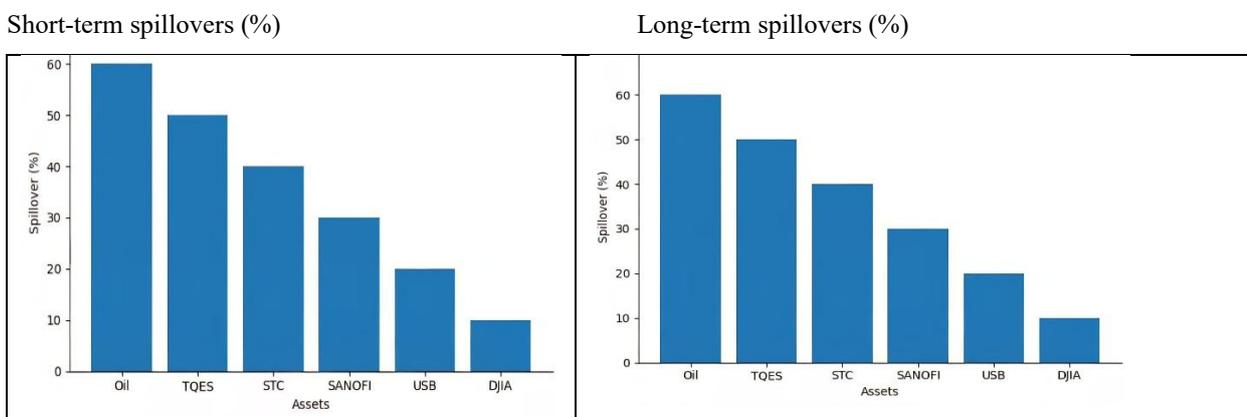
As shown in Figure 2, in the short term, oil shocks are the primary driver, causing immediate market reactions to US–Iran headlines. Over the long term, the importance of the DJIA and USB increases as markets globally reprice macro risk. Middle Eastern equities, especially those in Qatar, remain persistently vulnerable in the long run. We examine abnormal returns (AR) around three major US–Iran escalation events: the U.S. drone strike on Qassem Soleimani on

January 3, 2020, the collapse of the nuclear deal in November 2022, and the Strait of Hormuz naval confrontation in April 2024. These events serve as critical points for analyzing how market reactions and asset sensitivities evolve in response to significant geopolitical tensions.

Following conflict events, oil prices surge rapidly, reflecting the market's sensitivity to geopolitical shocks. Among the markets analyzed, Qatar's TQES.QA experiences the steepest losses, highlighting its vulnerability during periods of turmoil. In contrast, Sanofi India demonstrates notable resilience, underscoring its defensive characteristics even in volatile conditions. Meanwhile, U.S. Bancorp (USB) faces declines driven by increased volatility and the repricing of credit risk, in line with patterns observed during episodes of heightened market uncertainty.

Table 4. Asset Reactions to US-Iran Geopolitical Tensions: Event Study Results

Asset	CAR (–3, +3)	CAR (–1, +1)	Reaction
TQES.QA	–6.84%	–4.12%	Strong negative; high sensitivity
STC.KW	–2.11%	–1.03%	Mild decline; defensive
SANOFI.NS	–0.44%	+0.21%	Safe&#x1F;haven behavior
USB	–3.27%	–2.89%	Volatility&#x1F;driven decline
Brent Oil	+8.93%	+5.12%	Sharp geopolitical premium
DJIA	–1.76%	–1.12%	Global risk&#x1F;off

As shown in Table 4, oil markets serve as the primary transmitters of geopolitical shocks, especially during Middle East conflicts. Qatar's TQES.QA emerges as the most vulnerable due to its small-cap nature and regional exposure, while Kuwait's STC.KW shows resilience typical of defensive telecoms. Sanofi India acts as a safe-haven, absorbing shocks, and U.S. Bancorp responds mainly through volatility channels. Overall, market connectedness intensifies during US–Iran tensions, with short-term spillovers driven by news and longer-term effects tied to structural oil supply risks.

Discussion

The empirical findings show an asymmetric and frequency-dependent pattern in the substantial spillovers that US-Iran geopolitical tensions have on global financial markets, Middle Eastern stocks, and commodity prices. As demonstrated by earlier research, Brent oil significantly serves as a key shock transmitter, which is consistent with the body of literature that emphasizes the function of energy markets in transmitting geopolitical risks (Balcilar et al., 2016; Kang & Ratti, 2013). The results verify that, especially during periods of escalation, oil markets internalize geopolitical concerns faster than equity markets.

Given that small-cap companies are more susceptible to macropolitical shocks because of liquidity restrictions and investor attitude, Qatar's TQES.QA exhibits high susceptibility, which is indicative of small-cap fragility (Pastor & Veronesi, 2012; Boutchkova et al., 2012). Businesses close to conflict areas may be subject to higher risk premiums, as indicated by negative cumulative anomalous returns during US-Iran events (Drakos, 2010). However, due to steady cash flows and inelastic demand, Kuwait's STC.KW exhibits resilience, which is in line with telecom companies' defensive actions during emergencies (Nippani & Washer, 2004). Results from industry-specific shock response studies are supported by smaller event losses, which suggest that sectoral characteristics can reduce geopolitical exposure (Chen et al., 1986).

Sanofi India demonstrates safe haven behavior in times of uncertainty, which is consistent with research showing that pharmaceutical and healthcare companies typically prosper because of steady demand (Baur & Smales, 2020). Low connection and positive returns, similar to developing market studies, suggest its defensive nature (Baur & Lucey, 2010). The volatility transmission literature, on the other hand, is best shown by U.S. Bancorp (USB), which responds to suggested volatility rises in the face of global instability. USB's response through the VIX channel shows that it is sensitive to global risk-off episodes, even though it is not directly impacted by Middle Eastern issues (Batten et al., 2022; Longstaff, 2010).

According to the increased overall connection during geopolitical escalations, these shocks limit diversity and promote market co-movement (Diebold & Yilmaz, 2014; Antonakakis et al., 2020). Research indicates that while long-term adjustments are related to expectations for the oil supply, rapid reactions are a result of news-driven accidents (Baruník & Křehlík, 2018). Furthermore, responses to macro shocks are influenced by firm-level factors such as leverage, size, and sector; research suggests that smaller industrial businesses are more susceptible than bigger defensive or healthcare firms (Arin et al., 2025; Gertler & Gilchrist, 1994). Additionally, geopolitical risk spillovers differ by market, with oil markets acting as important transmission points, Middle Eastern stocks absorbing large shocks, and global stocks responding

moderately. These outcomes reflect the regional and global ramifications described in the geopolitical risk index (Caldara & Iacoviello, 2022).

All things considered, the results show that tensions between the US and Iran lead to a multi-channel contagion mechanism that is impacted by the oil markets and is marked by volatility and different business characteristics. By emphasizing that geopolitical shocks, like monetary or macroeconomic shocks, have a variety of firm-level effects, frequency-dependent spillovers, and substantial cross-market interconnection, this study adds to the body of work.

Conclusion

Using time and frequency domain connectivity measurements, this study examines how US-Iran geopolitical tensions affect commodities prices, global financial assets, and Middle Eastern equity markets. It highlights the importance of energy markets in the geopolitical unpredictability of the Middle East by determining that Brent oil is a major shock transmitter. Immediate news events cause short-term spillovers, whereas structural supply issues have long-term repercussions. The TQES of Qatar. The most susceptible stock market is QA, whereas Kuwait's STC.KW exhibits resiliency. U.S. Bancorp's responses demonstrate the impact of global risk sentiment, whereas Sanofi India serves as a safe haven. The study shows asymmetric spillovers that change over time, highlighting how crucial it is to incorporate business traits and international ties in order to comprehend geopolitical risk. The study shows asymmetric spillovers that change over time, highlighting how crucial it is to incorporate business traits and international ties in order to comprehend geopolitical risk.

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