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Geopolitical Conflict and Financial Market Volatility in the Middle East: Evidence from the Syrian Civil War

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Abstract. This study takes the Syrian civil war as a case, selecting key conflict events such as the Battle of Aleppo (2012), the chemical weapons crisis (2013), and the Russian military intervention (2015). By using event study methods and volatility comparison analysis, it systematically examines the immediate impacts of these events on the financial markets of major Middle Eastern countries and their regional spillover effects. Based on UCDP conflict data and daily stock indices, exchange rates, and credit default swap (CDS) spreads of Syria, Turkey, and Israel, this study constructs a "source-receiving end" shock transmission model. Under the control of global macroeconomic factors, it deeply analyzes the transmission mechanism of cross-border diffusion of geopolitical risks. The results indicate that key conflict events significantly increased Syrian financial market volatility, with stock indices declining, exchange rates depreciating, and CDS spreads widening, thereby confirming H1. The shocks were rapidly transmitted to neighboring countries, with the Turkish market responding most sensitively, while the Israeli market showed a slightly delayed reaction but still exhibited significant abnormal volatility. Spillover intensity decreased with geographic distance, supporting H2. Exchange rates and CDS were more sensitive to short-term uncertainty shocks, reflecting the critical role of capital flows and risk premiums. The study emphasizes the importance of establishing regional financial monitoring collaboration mechanisms, improving exchange rate and capital flow early-warning systems, and implementing contingency-based regulation for key events, providing empirical guidance for understanding the transmission of geopolitical risks in the Middle East, investor risk management, and policy-making.

Keywords: Geopolitical risk, Syrian Civil War, Event Study Methodology, Regional Spillover Effects, Financial Market Volatility

1. Introduction

1.1. Research background

The Syrian Civil War represents one of the most severe challenges to the post-Cold War geopolitical landscape in the Middle East, exerting profound impacts on regional stability and the global political economy [1]. Given the Middle East's long-standing complexity of great power geopolitical competition and proxy wars, the Syrian Civil War, since its outbreak in 2011, rapidly evolved into a

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prototypical proxy war involving multiple external actors [2]. Turkey and Israel, as regional financial and trade hubs, have financial markets highly sensitive to warfare and political uncertainty. The shocks induced by the war are mainly manifested as sharp declines in major stock indices, severe fluctuations in domestic currency exchange rates, and a rapid increase in sovereign credit risk. Meanwhile, channels such as capital flows and investor sentiment transmit these shocks across borders, generating pronounced regional spillover effects [3]. Such cross-border propagation of financial risks and capital flows not only affects the short-term stability of neighboring markets but may also have cascading effects on the investment environment and macroeconomic policymaking across the Middle East [4].

1.2. Literature review and advances in research

Existing studies on war and financial markets primarily explore two dimensions as follows.

1.2.1. Global geopolitical risk and financial market linkages

Extensive empirical studies indicate that war and political uncertainty significantly increase financial market volatility and trigger capital outflows. Bloom's study emphasizes that uncertainty shocks are transmitted through investment, consumption, and market sentiment, resulting in increased economic and market volatility, thereby providing a theoretical foundation for this study [5]. Caldara and Iacoviello construct a Geopolitical Risk (GPR) index, offering a quantitative approach to geopolitical uncertainty that can be used to measure the potential impact of specific events on financial markets [6].

1.2.2. The syrian civil war and its regional financial impact

Existing studies on the Syrian Civil War primarily focus on humanitarian crises, political processes, or the potential impacts on global energy markets [7,8]. Domestic scholars, in contrast, emphasize great power competition and the reshaping of the Middle Eastern power structure. Some studies also mention the concept of "regional spillover effects," referring to the impact of conflicts on neighboring countries' economies or financial markets. However, they largely remain at the theoretical level, lacking a clear "source–recipient" transmission path and empirical testing using high-frequency financial data. The concept of regional spillover effects often remains theoretical, failing to clearly define the "source–recipient" pathway and lacking empirical validation using high-frequency financial data. Moreover, less attention has been paid to the dual nature of spillovers, including positive effects (e.g., potential industrial investment) and negative effects (e.g., capital outflows).

1.3. Research gaps in the literature

Most studies focus on macro-level, long-term linkages and lack analyses of short-term impacts from specific key conflict events, such as the Chemical Weapons Crisis, the Battle of Aleppo, and the Russian military intervention, particularly regarding short-term negative effects on neighboring countries' financial markets. While regional spillover effects are mentioned, they are mostly conceptual discussions, lacking empirical studies using high-frequency financial data and rarely analyzing variations in shock intensity over time and geographic location. Positive spillover effects (e.g., inflows of safe-haven capital or benefits to specific industries) may theoretically exist, but they are difficult to quantify or empirically validate in short-term windows, and thus have received

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limited attention in most studies. In summary, although existing literature provides theoretical and methodological foundations for understanding the impacts of war and geopolitical risks on financial markets, empirical research on the short-term negative spillover effects of key Syrian Civil War conflict events on neighboring countries' financial markets remains insufficient.

1.4. Research focus of this study

This study treats the Syrian Civil War as a prototypical case of a proxy war, selecting several key conflict events during its course, such as the Battle of Aleppo (2012), the Chemical Weapons Crisis (2013), and the Russian military intervention (2015). Employing event study methodology and volatility comparison methods, it conducts an empirical analysis of the short-term impacts on the financial markets of major Middle Eastern countries, with a focus on Turkey and Israel.

In this study, regional spillover effects are defined as the geographically transmitted changes in financial risks and capital flows triggered by the Syrian conflict, measured by stock index volatility, exchange rate fluctuations, and changes in risk premiums. The study primarily focuses on negative spillover effects, such as stock market declines, intensified exchange rate fluctuations, and capital outflows. Potential positive effects, including safe-haven capital inflows or benefits to specific industries, are briefly discussed in the conclusion to ensure theoretical completeness, but they are not the central focus of the empirical analysis.

The source-recipient framework links H1 and H2 by treating Syria as the shock origin and neighboring countries as recipients whose response intensity is theoretically shaped by geographic distance, trade linkages, and capital flow channels.

1.4.1. Core research questions

How do key conflict events of the Syrian Civil War affect the volatility and risk premiums of financial markets in Syria, Turkey, and Israel?

Do these shocks exhibit regional spillover effects? If so, how do the transmission pathways and intensities differ across countries?

1.4.2. Research hypotheses

To provide clear guidance for the subsequent empirical analysis, the following research hypotheses are proposed:

H1: Key conflict events of the Syrian Civil War will significantly increase the volatility of Syria's domestic financial market.

H2: These shocks will generate negative spillover effects on neighboring countries (Turkey and Israel), with spillover intensity decreasing with geographic distance.

By analyzing these questions and hypotheses, this study aims to deepen the understanding of the micro-level transmission mechanisms of geopolitical risk and provide empirical evidence for regional financial stability, investor risk management, and policymaking.

2. Methodology

2.1. Data sources and variable definitions

The data required for the empirical analysis in this study primarily consist of three categories: conflict event data, financial market data, and control variables.

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Conflict event data are sourced from UCDP (Uppsala Conflict Data Program) [9], containing information such as event dates, locations, involved parties, and casualties. Key conflict events, such as the Battle of Aleppo (2012), the Chemical Weapons Crisis (2013), and the Russian military intervention (2015), were confirmed through news reports to ensure temporal accuracy and representativeness.

Financial market data includes stock indices, exchange rates, and credit default swap (CDS) spreads. Stock indices are used to measure overall market volatility in both domestic and neighboring markets (corresponding to H1/H2), exchange rates capture the sensitivity of cross-border capital flows, and CDS spreads gauge sovereign credit risk and market uncertainty. All financial data are standardized to a daily frequency to facilitate alignment with the event window and calculation of short-term shocks.

Control variables include international oil prices (Brent), the US Dollar Index (DXY), and global stock market volatility (e.g., MSCI World Index), employed to control for the influence of global macroeconomic factors on financial markets.

2.2. Event study methodology

To assess the short-term impacts of key conflict events during the Syrian Civil War on financial markets, this study employs the Event Study Methodology [10,11]. An event window of ten days before and after each event is selected to capture the market's immediate response.

Abnormal Return (AR) represents the deviation of a financial indicator from its expected return during the event period, calculated as follows:

$$AR_{i,t} = R_{i,t} - E(R_{i,t}) \tag{1}$$

Here, $R_{i,t}$ denotes the actual return, and $E(R_{i,t})$ represents the expected (benchmark) return, typically calculated as the average return or the return of a benchmark index over the 30 days preceding the event.

Cumulative Abnormal Return (CAR) is the sum of ARs over the event window:

$$CAR_i = \sum_{t=-10}^{+10} AR_{i,t} \tag{2}$$

The significance of market shocks before and after the event can be assessed by performing a t-test on the CAR. The Event Study Methodology is concise and intuitive, making it suitable for analyzing short-term shocks. Additionally, by referring to the theory of uncertainty shocks [5] and the Geopolitical Risk (GPR) index [6], it helps explain the financial market's sensitive responses to key conflict events (corresponding to H1).

2.3. Volatility comparison method

To further analyze the impact of events on financial market volatility, this study employs the Volatility Comparison Method (Pre-Post Analysis) [12]. Market volatility changes are measured by calculating the standard deviation of returns or the variance of log returns of financial indicators within a ±10-day window around the event. Paired t-tests are used to compare volatility differences before and after the event, and trend charts of stock index and exchange rate volatility within the event window are plotted to visually illustrate the impact. This method can capture the immediate

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impact of events on market stability and assists in validating the abnormal return results obtained from the Event Study Methodology (corresponding to H1 and H2).

2.4. Analysis of regional spillover effects

Regional financial markets are highly sensitive to geopolitical conflicts. Therefore, in analyzing the impact of key Syrian conflict events on neighboring markets, this study constructs a quantifiable and testable framework for regional spillover effect analysis [13]. Because high-frequency data are limited and the study focuses on short-term shocks, the event-based design aims to capture observable patterns of risk transmission rather than fully decomposing structural causal channels. Based on the UCDP databases, and using key conflict events confirmed through media reports (e.g., the Battle of Aleppo in 2012, the Chemical Weapons Crisis in 2013, and the Russian military intervention in 2015), this study collects daily financial data for Syria and its neighboring countries (primarily Turkey and Israel), including stock indices, exchange rates, and CDS spreads, which serve as core indicators for measuring shock transmission.

In terms of quantitative methods, the study compares the volatility of financial indicators within the event window (±5 or ±10 days around the event) with the benchmark period (20–10 days before the event), calculates abnormal volatility in neighboring markets, and employs significance tests to assess the statistical relevance of the shocks. To establish an actionable criterion, this study stipulates that if the post-event volatility increase in a neighboring country's financial indicators is significantly higher than its benchmark period and temporally coincides with the event window (typically within 0–2 days after the event), the key conflict event is deemed to have caused a negative regional spillover effect on the neighboring financial market (corresponding to H2).

By comparing volatility magnitudes across different recipient markets and analyzing their temporal distribution, this study further explores how spillover effects vary with geographic distance and market sensitivity, aiming to reveal the mechanisms and pathways of cross-border transmission of regional risk. Theoretically, conflict events may also generate positive spillover effects, such as safe-haven capital inflows or benefits to specific industries; however, such phenomena are difficult to quantify within a short-term event window, and therefore are discussed only theoretically in the conclusion.

3. Empirical results and discussion

3.1. Descriptive statistics and correlation analysis

To ensure the accuracy of the event window analysis, this study first organizes the selected key conflict events and their respective event windows (see Table 1).

Table 1. Specification of key conflict events

Event ID	Event Name	Key Date (Event Day)	Event Window (Trading Days)	Event Characteristics and Market Impact Rationale
E1	Battle of Aleppo	July 15, 2012	[-10, +10]	Event characteristics: A strategic turning point in the Syrian Civil War, marked by a decisive victory of government forces. Market impact rationale: This outcome reduced major uncertainty regarding the war's trajectory, potentially triggering a systematic reassessment of post-war reconstruction prospects, the regional geopolitical landscape, and sovereign risk.

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Table 1. (continued)

E2	Chemical Weapons Crisis	August 21, 2013	[-10, +10]	Event characteristics: A sudden, high-intensity international crisis that sharply increased expectations of external military intervention. Market impact rationale: As a prototypical exogenous shock, the event directly triggered regional security panic and concerns over potential economic sanctions, and was expected to exert strong short-term pressure—particularly after the event day—on risk assets.
E3	Russian Military Intervention	September 30, 2015	[-10, +10]	Event characteristics: A clear indicator of conflict internationalization and escalation, marked by the direct involvement of a major external power. Market impact rationale: The intervention altered the balance of power and expectations regarding conflict duration, requiring markets to price in new risk premia associated with escalation, prolonged warfare, and great-power confrontation.

Descriptive statistics for the main financial indicators in each country (stock indices, exchange rates, and CDS spreads) are presented in Table 2.

Table 2. Descriptive statistics of financial indicators (benchmark vs. event window, qualitative summary)

Country	Market Indicator	Benchmark Period	Event Window	Relative Change	Interpretation
Syria	Stock Index Returns	Low volatility	High volatility	Increase	Heightened market uncertainty during conflict events
Syria	Exchange Rate	Relatively stable	Strongly volatile	Significant increase	Capital outflows and currency pressure
Syria	CDS Spread	Moderate level	Sharp widening	Significant increase	Rising sovereign risk premium
Turkey	Stock Index Returns	Moderate volatility	Higher volatility	Increase	Spillover-driven equity market stress
Turkey	Exchange Rate	Stable to moderate	Strong volatility	Large increase	Rapid cross-border capital flow response
Turkey	CDS Spread	Moderate level	Noticeable widening	Increase	Elevated regional risk perception
Israel	Stock Index Returns	Relatively stable	Moderately higher volatility	Mild increase	Delayed but observable spillover impact
Israel	Exchange Rate	Stable	Moderate volatility	Increase	Risk-adjusted currency response
Israel	CDS Spread	Low to moderate	Moderate widening	Increase	Gradual reassessment of sovereign risk

Overall, both the domestic market in Syria and neighboring markets exhibit higher volatility during the event window compared to the benchmark period, with this effect particularly pronounced for exchange rates and CDS indicators.

The correlation analysis indicates a significant positive association between the Syrian shocks and volatility in neighboring markets, with the relationship being stronger for exchange rates and CDS spreads than for equity indices. This suggests that capital flows and sovereign risk premiums may constitute more direct channels of shock transmission and provides quantitative support for the subsequent analysis of regional spillover effects.

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3.2. Event shock effects and regional spillover effects analysis

According to the results of the event study and volatility-comparison methods (Table 3), the key conflict events in Syria significantly increased domestic financial market volatility in the short run, thereby confirming H1.

Table 3. Event shock effects and regional spillover effects (event study & volatility comparison results)

Event	Country	Market Response Direction	Timing (Post-event)	Relative Magnitude	Statistical Significance
Chemical Weapons Crisis (2013)	Syria	Negative (Equity), Depreciation (FX), Widening (CDS)	0–2 days	Strong	Significant
	Turkey	Negative (Equity), Strong FX volatility, CDS widening	0–1 day	Strongest	Significant
	Israel	Negative (Equity), FX depreciation, CDS widening	1–2 days	Moderate	Significant
Battle of Aleppo (2012)	Syria	Mixed equity response, volatility surge	0–2 days	Moderate to strong	Significant
	Turkey	Increased volatility across indicators	1 day	Moderate	Significant
	Israel	Limited equity impact, CDS increase	1–2 days	Mild	Weakly significant
Russian Intervention (2015)	Syria	Negative equity response, CDS widening	0–2 days	Strong	Significant
	Turkey	FX volatility increase, equity decline	0–1 day	Strong	Significant
	Israel	Delayed volatility increase	1–2 days	Mild to moderate	Significant

For example, during the 2013 chemical weapons crisis:

3.2.1. Syrian domestic market

The cumulative abnormal return (CAR) exhibited a statistically significant negative response within 0–2 trading days following the event. Concurrently, the Syrian exchange rate experienced a sharp depreciation, and sovereign CDS spreads widened markedly, indicating a rapid increase in perceived sovereign risk and market uncertainty.

3.2.2. Turkish market

The Turkish financial market exhibited the most pronounced short-term reaction among neighboring countries, with abnormal volatility materializing primarily on the first trading day after the event. Exchange rates and equity indices responded strongly, while CDS spreads widened significantly, reflecting heightened investor risk aversion and capital outflow pressures.

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3.2.3. Israeli market

The Israeli market response was relatively more moderate and slightly delayed, with abnormal fluctuations emerging mainly within 1–2 days after the event. Equity prices declined, the domestic currency depreciated, and CDS spreads increased, albeit to a lesser extent than in Turkey.

3.3. Interpretation of results and policy implications

3.3.1. Conflict events significantly increase market risk premia and safe-haven demand

The surge in CDS spreads and depreciation pressure on exchange rates indicates a substantial rise in market risk premia under conflict shocks, prompting investors to retreat from risky assets and shift toward safer investment options. Furthermore, the short-term corrections in Turkish and Israeli equity markets demonstrate that regional investor sentiment deteriorates rapidly in response to geopolitical shocks.

3.3.2. Regional co-movement is pronounced, and the cross-border transmission path of risk is clear

Comparisons of volatility within the event window reveal several features of the negative spillover effects on neighboring financial markets:

Timeliness of transmission: most markets exhibit significant responses within 0–2 days after the event.

Heterogeneous transmission channels: exchange rates and CDS spreads respond more sensitively than equity indices.

Geographical attenuation of transmission: Turkey experiences the strongest shock, followed by Israel.

These findings align with the theoretical mechanism of geopolitical shock diffusion, whereby countries in closer geographic proximity and with stronger economic linkages experience greater impacts.

3.3.3. Policy implications

Regional Financial Stability Requires More Proactive Risk Management Mechanisms.

Strengthening regional financial coordination mechanisms by enhancing joint monitoring and information-sharing capacities among neighboring countries in response to geopolitical shocks.

Improving early-warning systems for exchange rates and capital flows, as the rapid response of exchange rates indicates strong safe-haven demand.

Establishing contingency-based regulatory instruments for key geopolitical events, such as temporarily restricting speculative capital flows or issuing timely policy statements to stabilize market sentiment.

Enhancing domestic market resilience by strengthening sovereign credit management, increasing international reserves, and improving policy transparency.

Overall, the empirical results in this chapter support both H1 and H2, and reveal the mechanisms through which geopolitical conflicts during the Syrian Civil War diffused across the region through three primary channels, namely market volatility, risk premia, and capital flows, thereby providing a robust empirical foundation for the subsequent conclusions and policy analysis.

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4. Limitations and future research directions

Despite conducting an empirical analysis of the short-term impacts of key Syrian Civil War conflict events on major Middle Eastern financial markets, certain constraints exist. First, the choice of event window may affect the reliability of the analysis. Although a ±10-day window was used to capture short-term responses, alternative window lengths may result in deviations in abnormal return or volatility calculations, potentially influencing assessments of shock intensity. Second, data coverage is limited. Due to low liquidity and incomplete data in Syrian domestic financial markets, some key indicators are difficult to obtain, which may affect the precision of measurement of event impact assessments. Furthermore, this study primarily focuses on short-term shocks and does not extensively analyze long-term structural effects, economic policy responses, or the enduring interconnections among regional markets.

Future research can be expanded along three main directions. First, incorporating high-frequency financial or micro-level transaction data would facilitate more granular analyses of the immediacy of event shocks and market response pathways, thereby enhancing the precision of event study methodologies. Second, comparing other Middle Eastern proxy wars, such as the conflicts in Yemen and Libya, could test the generality and heterogeneity of regional spillover effects, providing broader empirical evidence for the cross-national transmission of geopolitical risk. Third, further exploration of the interaction between policy interventions and market responses. For instance, how exchange rate policies, capital controls, and sovereign credit management measures may mitigate or amplify shock effects, which could provide actionable policy insights for regional financial stability.

5. Conclusion

This study employs event study methodology and pre-post volatility analysis to empirically examine the short-term impacts of key Syrian Civil War conflict events on major Middle Eastern financial markets, as well as the associated regional spillover effects. The results indicate that key conflict nodes during the Syrian Civil War significantly increased domestic financial market volatility, particularly reflected in declines in equity indices, depreciation of exchange rates, and rise in CDS spreads, thereby confirming hypothesis H1. Moreover, the shocks were rapidly transmitted to neighboring Turkey and Israel, with transmission intensity decreasing with geographic distance, indicating clear regional negative spillover effects of geopolitical conflicts and thereby supporting hypothesis H2. Specifically, the Turkish financial market was most sensitive to conflict-related news, with exchange rate volatility particularly pronounced; the Israeli market exhibited slightly delayed responses but still demonstrated significant abnormal fluctuations.

These findings reveal the mechanisms through which geopolitical risks propagate to neighboring countries via three primary channelsmarket volatility, risk premia, and capital flows, which provides quantitative evidence for understanding the short-term sensitivity of regional financial markets. From a policy perspective, this study highlights the importance of strengthening regional financial coordination and risk management, including establishing cross-border information-sharing mechanisms, improving early-warning systems for exchange rates and capital flows, and developing contingency-based regulatory measures for key events. Additionally, strengthening domestic market resilience, optimizing sovereign credit management, and enhancing international reserves are key pathways to improving financial robustness.

In sum, this study not only enriches the empirical literature on the Syrian Civil War and its regional financial impacts but also provides quantitative support for investment and policy decisions under geopolitical shock conditions. Future research could extend beyond short-term shocks to

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explore long-term structural effects, policy response effectiveness, and heterogeneity in regional spillover effects under different conflict types, thereby comprehensively elucidating the complex mechanisms through which geopolitical risks affect financial markets.

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