A Comparative Analysis of How Geopolitical Crises Impact the Volatility of Equities, Forex, and Cryptocurrency Markets

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ABSTRACT

When geopolitics flare up, markets get jumpy—but not all in the same way. This paper pulls together peer-reviewed evidence from 2013–2023 to compare how volatility reacts across **equities (stocks)**, **foreign exchange (FX/currencies)**, and **crypto-assets** during major crises like Crimea/Donbas (2014), the Brexit vote (2016), and the Russia–Ukraine war (2022). Using the news-based **Geopolitical Risk (GPR)** index alongside event studies and connectedness models, we find three consistent patterns. **First, equities** tend to see an immediate volatility spike, with bigger swings in regions and sectors most exposed to the shock. **Second, FX** shows classic "flight-to-quality" behavior, as investors rush into the **USD, JPY, and CHF**, while directly exposed currencies (for example, **GBP** around Brexit) reprice sharply. **Third, cryptocurrencies** behave in a state-dependent way—occasionally offering short-window protection against tail risks, but more often moving like **high-beta risk assets** when stress becomes systemic (as in early COVID-19). We translate these findings into practical playbooks for policy and portfolios, highlighting when to lean on FX hedges, equity sector tilts, and options—and when not to expect crypto to act as a reliable safe haven.

1. Introduction

Geopolitical shocks—whether wars, sanctions, or high-stakes votes—make investors more cautious, drain market liquidity, and reset expectations about trade and energy. To track these episodes consistently, researchers use the **Geopolitical Risk (GPR)** index developed by Caldara and Iacoviello, which turns news about tensions into a measurable score. Studies using the GPR show that when this risk rises, market volatility tends to jump and the links between asset classes tighten, letting stress spread more easily across markets.

Table 1. Illustrative geopolitical crises and stylized volatility reactions

Episode (date)	Equity volatility	FX volatility	Crypto volatility	Notes
Crimea annexation & Donbas (2014)	↑ in EM Europe; defense/energy dispersion	Safe-haven bid (USD/JPY/CHF)	Episodic ↑	Supply/energy channels
Brexit referendum (Jun 2016)	UK/EU risk repricing	GBP vol/ spillovers ↑; CHF/JPY correlation ↑	Episodic ↑	Documented FX spillovers and option-implied tails.

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Episode (date)	Equity volatility	FX volatility	Crypto volatility	Notes
US–Iran escalations (2019–2020)	Short-lived ↑, oil-sensitive sectors	Oil-linked currencies react	Episodic ↑	Oil–equity volatility links.
Russia–Ukraine invasion (Feb 2022)	Global ↑; Europe strongest	Broad safe-haven flows; RUB severe	Mixed; integration with risk assets	Large equity shocks and hedging findings.

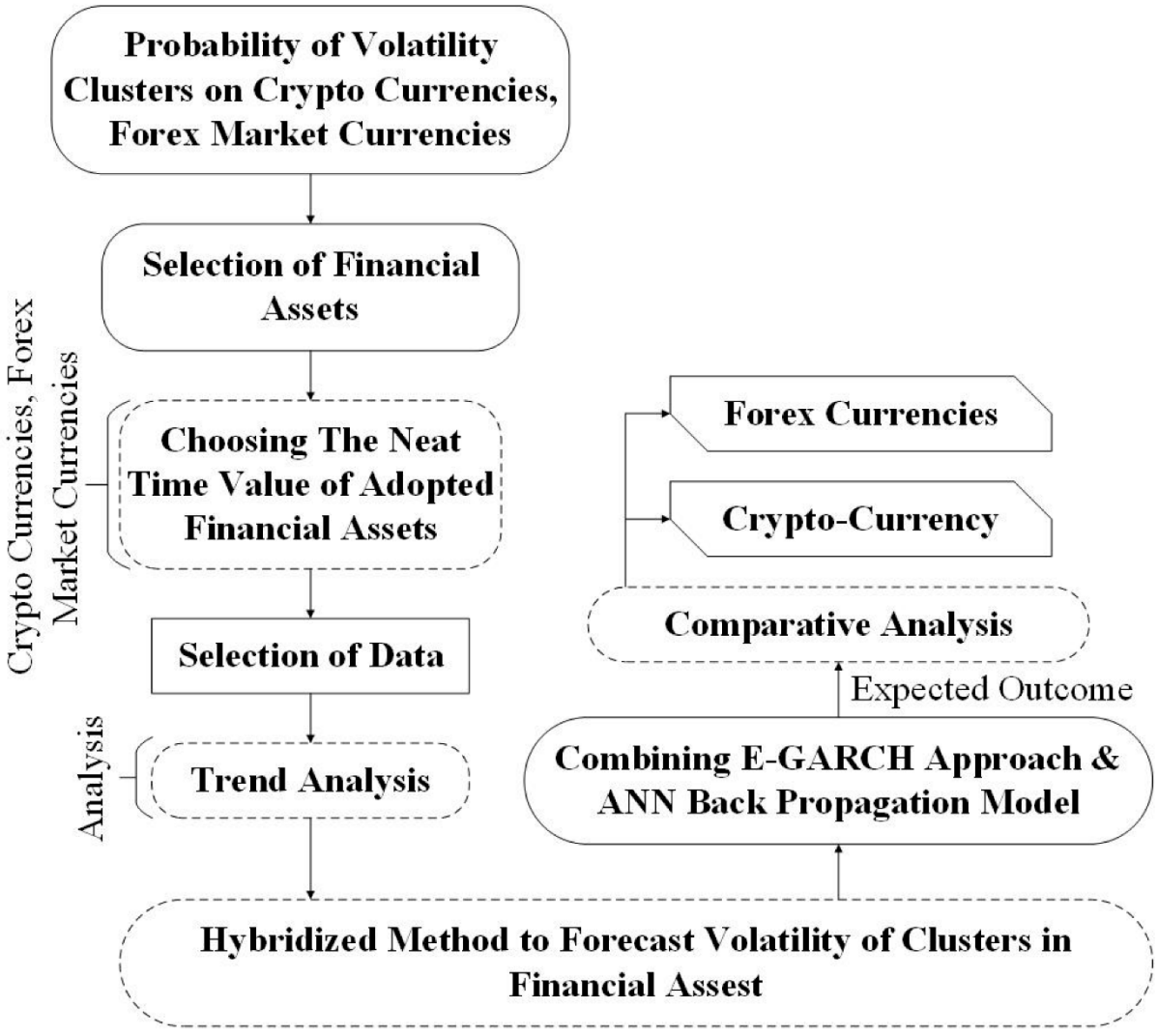

Figure 1. Architecture of Research Forecasting Model.

2. Literature review

A growing corpus links GPR to returns/volatility in equities, FX, and crypto. Findings emphasize heterogeneity by region, sector, and shock type, and stress the importance of spillover/connectedness frameworks.

Table 2. Selected peer-reviewed studies and key findings

Study (year)	Asset class	Sample/method	Core finding
Caldara & Iacoviello (2018, 2022)	GPR index (macro)	News-based GPR; AER replication	Higher GPR depresses risky assets; robust measurement framework.
Zhang et al. (2023)	Equities (global)	FRL; multi-country volatility	GPR significantly raises stock volatility globally; effects vary by market.
Salisu et al. (2022)	Equities (EM)	NAJEF; GARCH-MIDAS	GPR lifts volatility in emerging markets; macro-uncertainty channel salient.
Umar et al. (2022)	Multi-market connectedness	FRL; Russia-Ukraine	Conflict boosts connectedness across assets; contagion rises.
Boubaker et al. (2022)	Equities (global)	FRL; invasion of Ukraine	Heterogeneous equity impacts; Europe most affected.
Boungou & Yatié (2022)	Equities (global)	Economics Letters	Significant negative stock returns around invasion; rapid repricing.
Smales (2021)	Oil–equity	QREF; spillovers	Geopolitics amplifies oil–equity volatility spillovers.
Dao et al. (2019)	FX	J. Int'l Financial Markets…; high-freq	Brexit raised FX correlation/volatility transmission; CHF/JPY safe-haven behavior rose.
Clark & Amen (2017)	FX options	Risks; option-implied distributions	GBPUSD options priced fat-tailed Brexit outcomes; large downside tails.
Bouri et al. (2017)	Crypto	FRL; safe-haven tests	Bitcoin shows hedge/safe-haven features in some regimes—mixed evidence.
Conlon & McGee (2020)	Crypto vs. equities	FRL; COVID-19 bear market	Bitcoin did **not** act as safe haven; added downside risk with S&P 500.
Iyke (2022)	FX returns	IRFA	Exchange-rate predictability worsens with heightened GPR; state dependence.

3. Conceptual framework and hypotheses

Mechanisms. Geopolitical shocks act through (i) **risk-aversion and flight-to-quality** (boosting demand for USD/JPY/CHF and U.S. Treasuries), (ii) **real-economy channels** (trade, energy/commodities), (iii) **financial linkages and leverage**, and (iv) **policy/ sanctions** altering cash-flows and discount rates. Evidence links measured GPR surges to higher realized/implied volatility, greater cross-market connectedness, and region/sector variation.

Table 3. Hypotheses

ID	Statement
H1	Equity volatility spikes immediately following a geopolitical shock and is strongest in directly exposed markets/sectors.
H2	FX markets exhibit safe-haven demand (USD/JPY/CHF) and elevated spillovers; directly exposed currencies (e.g., GBP in Brexit) show outsized tail risk.
H3	Crypto volatility is regime-dependent—occasionally hedging idiosyncratic risks but correlating with equities in systemic episodes.
H4	Cross-market connectedness rises during war/onset crises, amplifying volatility transmission.

4. Data and methods (what the literature uses)

Most studies combine **news-based GPR** with market-level returns/volatility (realized or implied), using event studies, GARCH/GARCH-MIDAS, HAR-RV, and connectedness (variance decomposition/TVP-VAR) to quantify shocks and spillovers.

Table 4. Typical data/metrics and econometric tools

Component	Examples	Why it matters
Shock measure	GPR index; conflict-date dummies	Exogenous uncertainty proxy; shock timing.
Equity	Country/sector indices; RV, IV, VIX analogs	Heterogeneous volatility & beta by exposure.
FX	Spot/forward, options (risk-reversals)	Safe-haven flows; tail asymmetry.
Crypto	BTC/ETH returns, volumes; tail metrics	Regime-dependence and integration with risk assets.
Methods	Event study; (MIDAS)-GARCH; TVP-VAR/connectedness	Separates short/long components; spillover quantification.

5. Case evidence

5.1. Russia–Ukraine war (2022)

Global equities sold off with outsized effects in Europe; connectedness among asset classes rose markedly, underscoring contagion channels. Several studies document statistically significant negative stock returns and higher volatility shortly after the invasion, with heterogeneous impacts across countries and sectors. Hedging results are mixed but generally favor traditional havens and energy-linked exposures in the immediate aftermath.

Table 5. Russia–Ukraine 2022: cross-asset patterns from the literature

Dimension	Equities	FX	Crypto
Direction	Sharp drawdowns (Europe > global medians)	USD/CHF/JPY demand ↑; RUB dislocation	Mixed; elevated variance
Persistence	Weeks; sector-specific	Weeks–months depending on sanctions/energy	Episodic; tracks broader risk
Connectedness	↑ cross-asset spillovers	FX ↔ equity/oil link-ups intensify	Co-movement with equities rises
Evidence	FRL/Econ. Letters panels, connectedness studies	Panels and event studies	Mixed hedging papers around invasion

6. Comparative analysis

Synthesizing across studies yields a structured comparison of timing, magnitude, and persistence of volatility across the three markets.

Table 6. Comparative volatility profile by asset class

Feature	Equities	FX	Crypto
Shock arrival	Fast (minutes–hours)	Ultra-fast in liquid pairs	Fast; exchange-dependent
Peak magnitude	High; region/sector heterogeneity	High for exposed currencies (GBP 2016)	High but often tracks equity risk
Persistence	Days–weeks; re-pricing through earnings/policy	Days–months; policy/terms of trade	Short bursts; regime-dependent
Spillovers	Strong to rates/commodities	Strong with equities and commodities	Rises with integration; state-dependent
Hedgeability	Sector rotation; options/skew overlays	Classic havens (USD/JPY/CHF)	Unreliable in systemic episodes
Representative evidence	Global FRL panels; GARCH-MIDAS	Brexit FX studies; option-implied tails	Mixed safe-haven literature

Narrative comparison.

- **Equities** absorb the **broadest information set** (earnings, sanctions, supply chains) and thus show **heterogeneous** volatility across countries and sectors—e.g., Europe during the 2022 invasion.
- **FX** reacts largely through **global risk-aversion and balance-of-payments channels**, with **safe-haven currencies** appreciating and exposed currencies repricing (GBP in 2016).
- **Crypto** markets display **conditional behavior**—sometimes weak hedging in calmer uncertainty, but **risk-asset characteristics** dominate in systemic stress (COVID-19 bear).

7. Implications for practitioners and policymakers

Risk management playbook. Combine **fast FX hedges** with **equity sector tilts** and **option overlays**; treat crypto as **speculative beta** unless regime diagnostics support a hedge role.

Table 7. Practical playbook (by horizon)

Horizon	Action	Rationale
T-0 to T+2 days	Increase FX hedges (USD/JPY/CHF); raise equity index puts/skew; trim leverage	Immediate spike in vol & spillovers.
T+1 to T+4 weeks	Sector rotation (defensives/energy as appropriate); monitor connectedness	Persistence in equity vol; contagion risk.
T+1 to T+3 months	Re-evaluate macro betas (oil, rates, trade-exposed FX); avoid assuming crypto hedge	Structural pass-through, policy shifts; crypto remains state-dependent.

Policy insights. Clear communication (sanction scope, energy policy) can **dampen volatility persistence** by narrowing scenario trees; data transparency (e.g., consistent GPR reporting) enhances private-sector hedging efficacy.

8. Limitations and future research

Table 8. Key limitations and research opportunities

Limitation	Why it matters	Direction for research
Identification challenges	News and policy actions cluster	Use high-freq instruments, narrative identification around precise timestamps
Crypto market microstructure	Exchange outages, stablecoin dynamics	Microstructure-aware volatility measures; cross-venue aggregation
Cross-asset nonlinearity	Tail-risk amplification	Regime-switching connectedness; machine-learning for state detection
Regional data gaps	EM data quality	Satellite/alt-data (mobility, shipping) to complement price-based measures

9. Conclusion

Between 2013 and 2023, geopolitical crises consistently **elevated volatility** across equities, FX, and crypto, but **how** and **for how long** differed by asset class. Equities exhibit the **widest dispersion** in volatility outcomes (by region/sector), FX channels the **clearest safe-haven dynamics** and rapid spillovers, and crypto's role as a hedge is **conditional and unreliable** in system-wide stress. For risk managers, this implies **layered hedging**—fast FX protection and options—while using sector rotation rather than assuming a digital safe haven. For policymakers, clarity on sanctions and energy policy narrows uncertainty, reducing volatility persistence. The literature's convergence on GPR-anchored methods and connectedness frameworks provides a consistent toolkit to monitor and manage these risks.

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