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The Impact of Geopolitical Risks on Equity Markets and Financial Stress: A Comparative Analysis of Emerging and Advanced Economies

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Abstract:

Purpose: *This study aims to comprehensively analyze and compare the impacts of geopolitical risks on equity markets and financial stress in both emerging and advanced economies. We seek to understand how GPR affects market returns, volatility, and overall financial stability across different economic landscapes.*
Design/Methodology/Approach: *We employ a multi-faceted approach utilizing various econometric techniques. These include the GARCH-MIDAS model for volatility prediction, lead-lag regression, Markov regime-switching model, and panel quantile estimation. We use the geopolitical threats (GPT) index of Caldara and Iacoviello and consider both composite and decomposed GPR indices. Our analysis covers major emerging economies and the G7 countries, using daily stock returns and monthly GPR data.*
Findings: *Our findings reveal significant disparities in how geopolitical risks impact emerging and advanced economies. The U.S. equity market, particularly in the information technology and financial sectors, shows positive returns during high geopolitical threats. In contrast, emerging markets exhibit increased stock market volatility in response to GPR. Financial stress in emerging economies intensifies with increased GPR, especially when financial conditions are already strained. Advanced economies primarily witness GPR effects in their stock markets.*
Practical Implications: *The study also identifies optimal hedging strategies, such as between the U.S. market and gold, during periods of high geopolitical threats. These results have important implications for investment strategies and policy decisions in the face of geopolitical uncertainties.*
Originality value: *Geopolitical risks (GPR) significantly influence global financial markets. However, their impacts differ across economies and market segments. Previous studies have shown varied effects of GPR on asset prices, stock market volatility, and financial stress in different economic contexts.*

Keywords: *Geopolitical risk (GPR), equity markets, financial stress, emerging economies, advanced economies, market volatility.*

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1. Introduction

Geopolitical risks have become increasingly significant in recent decades, profoundly influencing investment decisions and capital flows across borders. The 2022 Russian invasion of Ukraine exemplifies how geopolitical events can lead to spikes in global threats, as noted by Caldara and Iacoviello (2022) and reported by The Economist (2022) and Blackrock Investment Institute (2023).

Research generally indicates a negative relationship between geopolitical risk and global equity returns. However, certain markets, particularly the United States, have demonstrated resilience and even positive performance during periods of heightened geopolitical tension (Antonakakis *et al.,* 2017; Alqahtani *et al.,* 2020)

The U.S. market exhibits significantly positive returns during periods of high geopolitical threats, likely due to its strong defense capabilities and geographical distance from conflict zones (Schneider and Troeger, 2006; Nikkinen *et al.,* 2008). Interestingly, the Chinese market has also demonstrated good hedging prospects in recent samples, possibly for similar reasons (Wang *et al.,* 2020)

A sector-level analysis reveals that information technology, communication, and materials sectors in the U.S. market show good hedges against geopolitical threats. The information technology and financial sectors, in particular, can be considered safe havens, demonstrating resilience and better performance during extremely high geopolitical threats (Balcilar *et al.,* 2018; Plakandaras *et al.,* 2019)

To gain a more nuanced understanding of market behavior under different conditions, a Markov regime-switching model with two volatility regimes (high and low) has been employed. This model shows that shifts in the geopolitical threat index primarily determine the equity returns of the whole market and several sectors in the U.S.

The information technology and communication sectors perform well in both high- and low-volatility regimes. Energy and materials sectors exhibit positive returns during the high volatility regime, while utility and healthcare sectors serve as effective hedges during low volatility conditions (Müller *et al.,* 2011; Rapach and Zhou, 2013).

To ensure the robustness of these findings, researchers have considered alternative measures of market uncertainty. These include the economic policy uncertainty (EPU) index developed by Baker *et al.* (2016), the economic uncertainty (Unc) index, the macroeconomic uncertainty index (MacroUnc) proposed by Jurado et al. (2015), and the CBOE implied volatility index (VIX). The results remain consistent even after adjusting for these alternative measures of uncertainty.

The influence of geopolitical threats on optimal hedge ratios has been examined by constructing portfolio pairs of the U.S. market with other major markets worldwide and various asset classes. Gold and information technology ETFs display the greatest asset pairings to counter geopolitical threats in the long run (Baur and Smales, 2020; Yang *et al.*, 2021)

These findings provide valuable insights into the complex dynamics between geopolitical risk and financial markets. They offer practical implications for investors seeking to protect their investments against geopolitical risks, as highlighted in speeches by central bank leaders like Carney (2016) and Powell (2019), and in reports by international financial institutions (IMF, 2017-2023; World Bank, 2021)

The research makes several key contributions to the existing literature. First, it demonstrates that among major global markets, only the U.S. exhibits significantly positive returns during periods of high geopolitical threats. This unique position is likely due to its strong defense capabilities and geographical distance from conflict zones.

Second, the sector-level analysis of the U.S. market reveals that several sectors, particularly information technology and finance, show positive associations with geopolitical threats and may serve as safe havens during extreme risk periods. This suggests that investors prefer to shift their investments to specific sectors and safer places during higher geopolitical threats.

Third, the use of a Markov regime-switching model provides a more nuanced understanding of sector performance during varying market conditions. This approach reveals that different sectors may serve as effective hedges depending on the prevailing volatility regime.

Fourth, the consideration of alternative measures of market uncertainty reinforces the robustness of the findings. By accounting for various types of uncertainty beyond geopolitical risk, the research provides a more comprehensive view of market behavior under different conditions.

Finally, the exploration of optimal hedge ratios for various portfolio pairs offers practical implications for investors. The finding that gold and information technology ETFs provide the best hedging opportunities against geopolitical risks in the long run can guide investment strategies during periods of heightened geopolitical tension.

These insights are particularly relevant in the current global context, where geopolitical risks are on the rise. As noted by various financial institutions and think tanks (McKinsey, 2016; J.P. Morgan, 2019; The Economist, 2022), geopolitical risk has become a key factor in investment decision-making.

The research underscores the importance of considering geopolitical risk in portfolio management and investment strategies. It suggests that while geopolitical threats generally have a negative impact on global equity returns, certain markets and sectors may offer safe havens. The U.S. market, in particular, seems to provide a better hedge against geopolitical threats than other countries and assets.

Moreover, the findings highlight the potential benefits of sector rotation strategies during periods of heightened geopolitical risk. By shifting investments to sectors that demonstrate resilience or even positive performance during high-risk periods, investors may be able to mitigate the adverse effects of geopolitical events on their portfolios.

2. Literature Review

The relationship between geopolitical risk (GPR) and financial markets has become a significant area of research in recent years. Early studies focused on specific geopolitical events or risks, such as political uncertainty, rare disasters, wars, and terrorist activities.

Schwert (1989) and Veronesi (2004) developed theoretical models demonstrating that increasing political instability can lead to higher stock market volatility. Erb *et al.* (1996) found a positive but weak relationship between political risk and future stock returns. Voth (2002) showed that political uncertainty partly explained the increasing stock volatility during the Great Depression. Boutchkova *et al.* (2012) and Pástor and Veronesi (2013) established a positive relationship between political uncertainty and stock volatility.

Researchers have also examined the impacts of rare disasters (Kaplanski and Levy, 2010; Berkman *et al.*, 2011), wars (Frey and Kucher, 2000; 2001; Choudhry, 2010), and terrorist activities (Aslam and Kang, 2015) on stock markets. However, these studies were limited in scope, focusing on specific events rather than capturing the general characteristics of GPR's influence on financial markets.

A significant advancement came with the development of a news-based GPR index by Caldara and Iacoviello (2018), providing a more comprehensive measure of geopolitical risk. This index encompasses various aspects of GPR, including terrorist attacks, war risks, military threats, and geopolitical tensions. Following its introduction, researchers began investigating the broader impacts of GPR on financial markets.

Studies have examined GPR's influence on stock volatility in specific industries, such as global defense companies, travel and leisure companies (Demiralay and Kilincarslan, 2019), and rare metals companies (Zhou *et al.*, 2021). Other research has focused on the general impact of GPR on stock price indices and its specific role in different countries (Bouras *et al.*, 2019; Gkillas *et al.*, 2018; Balcilar *et al.*, 2018).

Recent studies have also explored GPR's effects on alternative investments like gold and crude oil Smales, 2021; Liu *et al.*, 2019)

Despite these advancements, the relationship between GPR and stock market volatility remains understudied, with most research concentrating on the impact of GPR on stock market returns. Additionally, the majority of studies have focused on developed economies, leaving a gap in understanding GPR's effects on emerging markets (Hoque and Zaidi, 2020).

The distinction between the impacts of regional and global GPR on stock market volatility has not been thoroughly explored, despite its particular importance for emerging economies vulnerable to both local and global GPR shocks.

The GARCH-MIDAS model has emerged as a popular tool for examining the low-frequency macroeconomic drivers behind changes in financial volatility, offering potential for more nuanced analysis of GPR's impacts on stock market volatility (Wang *et al.*, 2020; Fang *et al.*, 2020). This model allows for the incorporation of variables with different frequencies, which is particularly useful when dealing with daily stock market data and monthly GPR indices.

Future research could benefit from exploring the differential impacts of regional and global GPR on stock market volatility, particularly in emerging economies. Additionally, investigating the transmission mechanisms through which GPR affects stock market volatility could provide valuable insights.

The use of more sophisticated econometric techniques, such as the GARCH-MIDAS model, could help in capturing the complex dynamics between GPR and stock market volatility across different time horizons and market conditions.

3. Research Methods

Research into the relationship between geopolitical risks and financial markets employs various sophisticated methodologies to capture the complex dynamics at play. These approaches range from simple regression models to more advanced techniques that account for volatility and distributional effects.

A fundamental approach uses simple regression models to examine how changes in geopolitical threats affect various assets (Caldara and Iacoviello, 2022). The typical model takes the form:

$$Rt = \beta0 + \beta1\Delta GPTThreatt + \beta2\Delta CPIt + \beta3\Delta UNEMPt + \beta4\Delta BondYieldSpreadt + \beta5\Delta TermPremiumt + \beta6\Delta Tradevolumet + \varepsilon t$$

Here, Rt represents asset returns, ΔGPTThreat is the change in geopolitical threat index, and other variables control for changes in economic indicators. This model

allows researchers to analyze how geopolitical threats impact different asset returns while controlling for other factors (Liu *et al.,* 2019)

To capture more nuanced volatility dynamics, researchers often turn to the GARCH-MIDAS framework (Engle *et al.,* 2013). This approach is particularly useful for examining the predictive role of global geopolitical risk (GPR) in stock market volatility. The GARCH-MIDAS model allows for the use of mixed data frequencies, combining high-frequency stock return data with lower-frequency GPR data.

The model decomposes conditional variance into short-run and long-run components:

$rit = \mu + \sqrt{\tau}tgit\varepsilon it$

In this equation, rit is the stock return, τt is the long-run component incorporating the GPR predictor, and git is the short-run component following a GARCH(1,1) process (Ghysels *et al.,* 2004). The key coefficient of interest is θ, which indicates the predictability of the GPR variable.

To capture impacts across different market conditions, quantile regression methods have gained popularity (Uribe and Guillen, 2020). These methods provide insights beyond average relationships, examining impacts across the full distribution, including at extremes. A commonly used approach is the conditional quantile regression model with fixed effects developed by Machado and Silva (2019):

$Yt,m = \alpha m + \delta Xt,m + (\lambda m + Zt,m\gamma)Ut,m$

Where Yt,m is the dependent variable (often a measure of financial stress), Xt,m are explanatory variables including GPRs, αm and λm capture country fixed effects, and Ut,m is the error term (Galvao and Kato, 2017). This approach allows for examination of how GPRs impact financial stress differently across quantiles, especially during extreme episodes (Firpo *et al.,* 2009; Borah and Basu, 2013.)

These methodologies collectively provide a comprehensive approach to understanding the complex interactions between geopolitical events and financial markets. The simple regression model offers a baseline understanding of how geopolitical threats impact asset returns.

The GARCH-MIDAS framework enables more sophisticated modeling of volatility dynamics, incorporating mixed-frequency data to improve predictive power. The quantile regression approach allows for nuanced examination of how geopolitical risks affect financial stress across different market conditions, from calm periods to extreme events.

Together, these methods allow researchers to capture both average effects and impacts at different points in the distribution, account for volatility dynamics, and incorporate data at different frequencies (Baur and McDermott, 2010; Baur and Smales, 2020). This comprehensive approach helps to provide a more complete picture of how geopolitical risks influence financial markets.

The choice of methodology often depends on the specific research question and the nature of the data available. For instance, when dealing with high-frequency financial data and lower-frequency geopolitical risk indicators, the GARCH-MIDAS model may be particularly appropriate. On the other hand, when researchers are interested in how geopolitical risks affect different parts of the financial stress distribution, quantile regression methods become invaluable.

These advanced methodologies have significantly enhanced our understanding of the intricate relationships between geopolitical events and financial markets. They provide crucial insights for investors, policymakers, and researchers seeking to navigate the increasingly complex global financial landscape (Das *et al.*, 2019; NguyenHuu, 2022). As geopolitical risks continue to evolve and impact financial markets in new ways, these methodologies will undoubtedly continue to play a vital role in economic and financial research.

4. Results

Geopolitical Risk (GPR) exerts significant and varied impacts on financial stress (FS) across emerging and advanced economies. In emerging economies, a one standard deviation increase in GPR leads to a 0.033 to 0.085 standard deviation increase in the composite FS index, with effects being statistically significant across different model specifications (Caldara and Iacoviello, 2022).

The impacts are more pronounced in the middle and higher quantiles of FS, suggesting that GPR exacerbates existing financial stress rather than triggering it. Foreign exchange and bond markets in emerging economies show particular vulnerability to GPR, especially at medium and high stress levels (Salisu *et al.,* 2021).

At the 90th quantile, a one standard deviation increase in GPR can cause a 0.088 standard deviation increase in the FS index of the currencies market, while the bond market exhibits effects twice as high as in the overall financial industry (Presbitero *et al.,* 2016).

The banking sector in emerging economies shows sensitivity to GPR mainly at lower stress levels, while stock markets demonstrate resilience across all quantiles (Balcilar *et al.,* 2018). These findings indicate that GPR affects different segments of the financial market heterogeneously, with currencies and bond markets being the most susceptible to geopolitical uncertainties (Feng *et al.,* 2022).

In contrast, advanced economies (G7) exhibit a more uniform response to GPR across different stress levels. A one standard deviation increase in GPR leads to approximately a 0.11 standard deviation increase in the FS index for advanced economies, with impacts being similar across quantiles (Park and Mercado, 2014).

This suggests that geopolitical events in emerging economies affect advanced economies' financial situations in a more homogeneous pattern (Balakrishnan *et al.*, 2011). Unlike in emerging economies, stock markets in advanced economies show adverse impacts from GPR on both market returns and volatility, particularly during high-stress episodes (Boubaker *et al.*, 2022).

This difference may be attributed to the international connectedness of stock markets and the significant role emerging markets play in advanced economies (Bhuyan et al., 2016). However, other sectors such as foreign exchange markets, bond markets, and banking sectors in advanced economies appear largely unaffected by geopolitical uncertainties originating from emerging economies (Caplain *et al.*, 2017; Petrov *et al.*, 2019).

The study notes that the impacts of GPR on emerging economies may be less pronounced due to the diverse development levels and economic structures within the sample, whereas the more homogeneous nature of advanced economies might contribute to their more uniform response to GPR (Glick and Taylor, 2010).

These findings highlight the complex and varied ways in which geopolitical risks impact financial markets across different economic contexts, emphasizing the need for nuanced approaches in managing and mitigating these risks in both emerging and advanced economies (Wade and Lauro, 2019; Jung *et al.*, 2021)

5. Conclusion

Geopolitical risks (GPRs) significantly impact financial markets and asset returns, with effects varying across economies, market sectors, and asset classes. In the U.S. equity market, certain sectors like information technology and financials exhibit positive returns during high geopolitical threat periods, potentially serving as safe havens for investors.

The U.S. market as a whole, along with specific sector ETFs such as information technology and utilities, maintain significant positive associations with geopolitical threats even after controlling for false discovery rates and other factors. This suggests opportunities for investors to hedge against geopolitical risks through strategic portfolio allocation.

The impact of GPRs on emerging markets differs from that on advanced economies. In emerging markets, GPRs primarily affect foreign exchange markets and, to a lesser extent, banking and debt sectors. The magnitude of impact varies based on

market stress levels. Interestingly, stock markets in emerging economies appear relatively robust to geopolitical disturbances, contrasting with advanced economies where GPRs significantly impact stock markets. The act-related GPR index tends to be a better predictor of stock market volatility in emerging markets compared to the threat-related index.

Research has shown that both GPR and GPRS (serious geopolitical risks) have significant positive impacts on stock market volatility, with GPRS having a larger effect. This indicates that market participants are more sensitive to serious geopolitical risks.

In China's stock market, for example, geopolitical threats (words) appear to have a more significant impact than actual geopolitical acts. The GPRs of various countries and regions also influence the Chinese stock market to different degrees, with some reducing volatility and others increasing it.

The GARCH-MIDAS model has proven useful in analyzing the relationship between GPR indices and stock market volatility. This approach allows for the incorporation of mixed-frequency data, providing more robust information and avoiding potential biases.

Studies using this model have found that emerging stock market volatility responds positively to both country-specific and global geopolitical risks, suggesting that higher geopolitical risks may increase stock market volatility in emerging markets.

These findings have important implications for investors and policymakers. They highlight the need for tailored strategies and reaction plans that account for the differential impacts of GPRs across various financial sectors and market conditions.

Investors should consider the fragility of relevant asset markets when building or adjusting their portfolios. Policymakers, particularly in emerging economies, should pay close attention to geopolitical risks and their components (especially act-related GPRs) when predicting and managing stock market volatility.

As geopolitical uncertainties continue to shape the global economic landscape, understanding and anticipating these nuanced effects becomes crucial for effective risk management and investment decision-making in both developed and emerging markets.

Future research could explore the economic significance of including GPR in predictive models of stock market volatility, as well as investigating the relationships between geopolitical threats and derivative securities such as options and futures in the equity market. Additionally, examining potential hedging opportunities for investors using derivatives in combination with stocks from

different sectors and/or precious metals could provide valuable insights for portfolio management in an increasingly complex geopolitical environment.

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