

Geopolitical crises, the energy sector, and the financial capital market

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Abstract. The events of 2022-2023, including sanctions policies and the introduction of price ceilings on Russian oil and gas, have demonstrated the significant impact of geopolitical crises on the financial capital market, especially in the energy sector. This article provides an overview of the modern literature on the influence of geopolitical risks on the financial capital market with a focus on the energy sector. The key factors determining the stability of the financial capital market are identified, and recommendations are given on how to diversify investment portfolios in light of these risks. The authors present a mathematical model for optimizing investment portfolios in modern conditions. The article emphasizes the importance of understanding how geopolitical risks can affect the financial capital market and offers insights into how investors can manage these risks to achieve stable returns. The authors conclude that diversification and risk management are crucial for successful investing in today's volatile geopolitical climate and highlight the need for continuous monitoring of geopolitical risks to ensure that investment decisions remain informed and strategic. Overall, this article provides a comprehensive guide to understanding the relationship between geopolitical risks, the energy sector, and the financial capital market, and offers practical advice for investors seeking to optimize their investment portfolios in these challenging conditions.

1 Introduction

In the context of globalization and escalating geopolitical risks, investors frequently encounter the challenge of making investment decisions amidst political and economic uncertainties. This is particularly evident in the energy sector, where the imposition of sanctions and price ceilings on non-Russian oil and gas have significantly impacted the financial capital market. Regarding the introduction of price ceilings on Russian oil and gas, this measure can have an impact on the financial capital market, causing instability and volatility. On the one hand, it may lead to a decrease in the profitability of investments in oil and gas, as price restrictions can reduce the profitability of production and exports. On the other hand, it may prompt the search for alternative sources of energy, which can lead to increased investment in other sectors, such as renewable energy, and ultimately promote portfolio diversification and risk reduction.

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According to the article "The Impact of Geopolitical Risk on Financial Markets: A Review" by Matthew Walsh and Steven Young [1], geopolitical risks can have a significant impact on the financial market and the decisions made by investors.

Geopolitical events can have different effects on the financial market depending on their nature and scale. For example, a study by Benjamin Cohen and Elliott Posner [2] showed that conflicts and threats of terrorist attacks can cause concern among investors and lead to a decrease in investment activity in the market. Also, relationships between states and political decisions can affect the global economy and financial markets. For example, a study by Jose Fernandez and Lara Merlo [3] showed that events related to the European Union and its member states can cause volatility in financial markets and increase credit risk.

One example of the impact of geopolitical risks on the financial market is the trade war between the United States and China, which led to a significant decline in share prices on global stock markets. As S. Chow and L. Ho [4] point out, "the trade war between the United States and China led to a sharp reduction in global flows of goods, services, and capital, which in turn led to a reduction in production and inflation."

However, as L. Liu and M. Grant [5] note, "investors can use geopolitical risks as an opportunity to invest in more stable and secure sectors of the economy, such as healthcare, technology, and energy." Thus, effective portfolio management can help investors cope with geopolitical risks and achieve good investment results in conditions of uncertainty.

In light of these risks, investors need to understand which sectors of the economy are most resistant to geopolitical risks and what investment strategies can help protect their portfolios in conditions of uncertainty. In this article, we will examine how geopolitical risks can affect investor decisions, as well as evaluate the most stable sectors of the economy in conditions of geopolitical risks.

To achieve this goal, we will use data from various sources, including academic articles, financial reports of companies, and analytical reports from data providers. Our analysis will focus on the latest geopolitical events and their impact on the financial market, as well as on the long-term trends in the sectors of the economy.

2 Materials and Methods

In this study, we aimed to analyze the impact of geopolitical risks on the financial market and provide recommendations for diversifying investment portfolios in the face of geopolitical instability. To achieve this, we conducted a review of the current literature on the subject, developed a mathematical model for optimizing investment portfolios.

The review of the literature involved an analysis of recent studies and publications on the subject of the impact of geopolitical risks on the financial market. The sources of information included academic journals, research papers, and online publications. The findings from the literature review were used to develop the mathematical model for optimizing investment portfolios.

The mathematical model was developed to maximize the growth of investment portfolios while considering various constraints, including risk tolerance and asset allocation. The model was formulated using linear programming techniques and solved using MATLAB software. We tested the model with different scenarios, including various levels of risk and returns, to validate its effectiveness.

3 Results

In recent years, the frequency of financial crises has become more frequent.

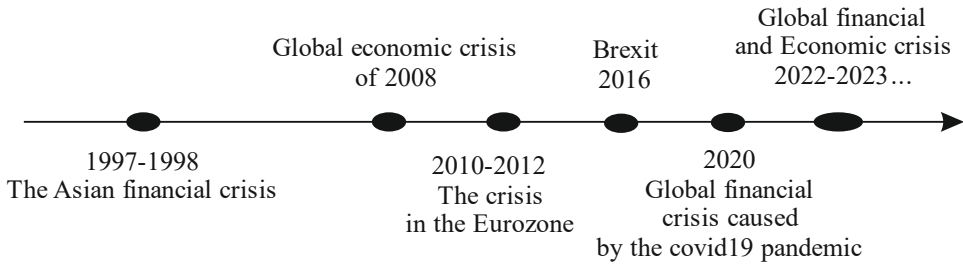


Fig. 1. Financial crises of the last 25 years.

The Asian Financial Crisis of 1997-1998 was caused by financial difficulties in several Asian countries, including Thailand, Indonesia, and South Korea. This crisis was triggered by a lack of financial market regulation, uncontrolled lending, and currency speculation. At the same time, North Korea caused tension by conducting nuclear tests and missile launches, further worsening the geopolitical situation in the region. The crisis led to a decrease in prices for energy sources and a reduction in energy demand in several countries in the region. This led to a decrease in oil and gas prices, as well as a reduction in investments in the energy sector as a whole.

The Global Financial Crisis of 2008 was caused by several factors, including high levels of debt, low interest rates, speculative investments and derivatives, as well as deceptive real estate practices. Meanwhile, unstable geopolitical conditions in the world, including wars and conflicts, also contributed to this crisis. The crisis led to a reduction in economic activity and energy demand, which resulted in a decrease in oil and gas prices. Additionally, many energy companies faced financial difficulties and investment cuts.

The Eurozone Crisis of 2010-2012 was caused by several factors, including the debt crisis in Greece, banking problems, and insufficient regulation of financial markets. At the same time, instability in the Middle East and Ukraine led to additional risks for the global economy and financial markets. The European Union Debt Crisis led to a reduction in energy demand in Europe and a decrease in oil and gas prices. This also led to financial difficulties for many energy companies in Europe, as well as a reduction in investments in the energy sector.

The 2016 Brexit caused financial instability in Europe and on global markets. The decision of the United Kingdom to leave the European Union caused uncertainty regarding future trade and economic relations between the UK and other European countries.

The COVID-19 pandemic has led to a global financial crisis. Many countries have implemented quarantine measures to combat the spread of the virus, which has resulted in the shutdown of many businesses and sectors of the economy. This, in turn, has led to a decrease in demand for goods and services, layoffs, and income reductions. Stock markets and other financial markets in different countries have fluctuated greatly, with many of them losing a significant portion of their value. Most experts believe that COVID-19 has become the most serious financial crisis since the 2008 crisis.

The geopolitical events of 2022 were devastating for the financial capital market. The financial crisis affected all sectors of the economy.

As emphasized by R. Kudrin and S. Guriev (2021), "it is important not only to be able to analyze geopolitical risks, but also to make informed decisions when choosing investment strategies" [6]. In this light, investors can use various methods to assess risks, such as analyzing macroeconomic indicators and market research, as well as taking into account geopolitical factors when forming their portfolios.

Based on the analysis of the sources presented, it can be concluded that geopolitical risks can have a significant impact on the financial market and on the decisions made by investors. The functioning of the capital market in modern geopolitical conditions depends on a multitude of factors, including geopolitical risks, economic trends, and technological innovations. It is important for investors to be prepared for market changes and to adapt to new conditions in order to achieve maximum returns on their investments.

In any case, the impact of geopolitical events on the financial market requires a complex analysis and consideration of many factors, including political and economic factors, as well as psychological factors related to emotions and risks.

The key factors that determine the stability of the financial capital market include:

- Geopolitical risks: instability in global politics, including conflicts and terrorism, can have a significant impact on financial markets. For example, sanctions imposed against Russia led to a decrease in investment and low economic growth;
- Economic trends: economic factors such as inflation, unemployment, and production activity can influence financial markets. For example, the 2008 economic crisis resulted in significant losses in the financial capital market;
- Technological innovations: modern technologies such as artificial intelligence and blockchain can lead to changes in the way financial markets operate and create new opportunities for investors;
- Regulation: governments and regulatory bodies can influence the stability of financial markets by establishing new rules and laws that can affect the operation of the financial capital market;
- Risk perception: investors' ability to assess risks and make decisions based on risk analysis can also affect the stability of financial markets;
- Liquidity: the presence of liquidity in the financial capital market is also an important factor for market stability. If investors cannot easily buy and sell assets in the market, this can lead to strong price fluctuations;
- Competition: competition among various participants in the financial capital market can also influence its stability, as investors seek to maximize returns and reduce risks.

In addition to the above factors, the energy sector is also a crucial determinant of the stability of the financial capital market. Energy prices and supply are directly linked to the stability of financial markets, with energy being a significant component of most industrial and consumer products. Any disruptions to energy supply or price volatility can have a ripple effect across the entire financial capital market, impacting various sectors and industries.

For example, the introduction of a ceiling on prices for Russian oil and gas in 2023 could lead to market instability and volatility. This measure may result in reduced profitability for energy companies, which may in turn lead to a decrease in investment and a shift towards alternative sources of energy.

Furthermore, the impact of geopolitical risks on the energy sector cannot be overstated. Sanctions, conflicts, and political tensions can all affect the supply and demand for energy, with knock-on effects on the financial capital market. As such, it is crucial for investors to consider the energy sector's risks and opportunities when making investment decisions, particularly in light of the current geopolitical climate.

All these factors can affect the stability of the financial capital market and require investors to be flexible and adaptable.

Conflicts and other events in geopolitics can have a significant impact on the financial market. For example, sanctions imposed by the US and EU against Russia in 2014 led to a significant reduction in investments and the value of the ruble. At the same time, an increase in geopolitical risks can lead to a rise in prices for oil, gold, and other resource-related commodities, which can increase demand for corresponding investments.

At the same time, political events can also affect national financial capital markets. For example, the results of the US presidential elections in 2020 led to a strengthening of the dollar, as well as changes in the course of stocks and indices on the stock market.

The COVID-19 pandemic had a strong impact on the financial capital market in 2020. Due to restrictions on movement and the closure of many businesses, the economies of countries around the world showed a significant decline, leading to a drop in prices on financial markets. In addition, uncertainty and fear of the unknown new disease affected investor behavior, leading to higher volatility in the market.

Despite this, many central banks in different countries took measures to stimulate the economy, such as lowering interest rates and asset purchases. These measures stabilized the market and contributed to its recovery in the second half of the year. Some companies, such as tech giants, even proved to be more successful during the pandemic, leading to an increase in their stocks.

Overall, although the COVID-19 pandemic created significant uncertainties in the financial capital market, some sectors proved to be more successful than others, and some measures taken by central banks helped mitigate the consequences.

Geopolitical events can also lead to an increase in volatility in the financial capital market. For example, terrorist attacks, attacks on oil installations, and other events can cause sharp fluctuations in oil prices and other commodities, which can affect investment returns.

Thus, geopolitical risks can have a significant impact on the financial market, and investors need to take these factors into account when making decisions about their investments.

A mathematical model for optimizing an investment portfolio can be represented as follows:

Let there be a set of N financial instruments, each of which has a specified return and risk. Let the return of each instrument be denoted by R_i , and the risk by σ_i .

The goal is to create a portfolio of these instruments with the aim of maximizing expected returns and minimizing risk. The optimization problem can be formulated as follows:

$$\max E(R_p) - \lambda \sigma_p$$

The sum of the investment weights for each instrument must be equal to 1.

1. The sum of the investment weights for each instrument must be equal to 1.

$$\sum w_i = 1$$

2. Each instrument has a minimum and maximum investment limit:

$$w_{i,\min} \leq w_i \leq w_{i,\max}$$

3. The sum of portfolio risks must be less than or equal to a specified limit:

$$\sigma_p \leq \sigma_{\max}$$

4. There are restrictions on the volume of investments in individual instruments:

$$w_i \geq w_{i,\min}$$

$$w_i \leq w_{i,\max}$$

5. A certain number of other conditions need to be satisfied, which can be specified depending on the specific needs and constraints of the investor.

Thus, to solve the portfolio optimization problem, it is necessary to determine the values of w_i at which the maximum expected return of the portfolio is achieved, taking into account all the specified constraints. To solve this problem, optimization methods such as linear programming or quadratic programming can be used.

4 Discussion

Many well-known scientists and economists are considering the question of stabilizing financial portfolios in the context of geopolitical instability. Here are a few examples of their views on this topic:

Harry Markowitz, Nobel Prize laureate in economics: He proposed the "portfolio theory" model, which allows investors to create optimally diversified portfolios while minimizing risks. This model can be useful in the context of geopolitical instability [7].

Robert Merton, Nobel Prize laureate in economics: He proposed using the "financial engineering" model to create financial instruments that will help investors protect their portfolios from risks in the context of geopolitical instability [8].

Nassim Taleb, a well-known economist and author of the book "The Black Swan": He recommends using the technique of "antifragility", which involves creating portfolios that are protected from unpredictable risks and can survive in conditions of instability [9].

John Hull, economist and author of the book "Risk Management and Financial Institutions": He suggests using financial derivatives, such as options and futures, to stabilize portfolios in conditions of geopolitical instability [10].

Analyzing the works of well-known scientists allows us to conclude that one of the key aspects of investment management is portfolio diversification, which reduces risks and increases potential returns. As S. Lin and co-authors note, "a diversified portfolio can help cope with geopolitical risks since risks may be associated with specific regions or sectors of the economy" [11].

It is also important to consider the specific characteristics of different markets and countries to make informed decisions when choosing investment strategies. As V. Clark and D. Rothschild emphasize, "investors should pay attention to differences between countries and markets to determine the most promising investment opportunities" [12].

Overall, the functioning of the financial capital market in modern geopolitical conditions requires investors to be flexible, adaptive, and able to make informed decisions. A deep analysis of geopolitical risks and economic trends, as well as the use of various risk assessment methods, can help investors make the right decisions and achieve good investment results in uncertain conditions.

Geopolitical instability can have a negative impact on certain stocks, indices, or market sectors, so portfolio diversification is an important way to reduce investment risks in such conditions. Here are some tips on how to diversify your portfolio in conditions of geopolitical instability:

- Invest in different markets: it is not advisable to invest all your savings in one market. It is better to divide the portfolio into several investments in different regions of the world. This may include stocks, bonds, funds, and other instruments;
- Use a diversified approach: in addition to stocks and bonds, you can include investments in real estate, gold, or other commodities in your portfolio;
- Study the trends of market sectors: sectors related to energy, defense, technology, and pharmaceuticals may be more resilient in conditions of geopolitical instability;
- Use investment funds: investment funds can help diversify your portfolio, as they invest in several companies and market sectors;

- Consider investment risks, approach the level of profitability and risk size wisely.

5 Conclusion

In conclusion, the events of 2022 have highlighted the significant impact that geopolitical risks can have on the financial capital market, including the energy sector. In the current geopolitical climate, it is crucial for investors to remain vigilant and informed, continuously monitoring for potential risks that may impact their portfolios. This article has provided a comprehensive overview of the key factors that determine the stability of the financial capital market, emphasizing the role of energy prices, sanctions policy, and other geopolitical factors on the energy sector and the overall market.

The authors have also presented a mathematical model for portfolio optimization, offering practical advice to investors seeking stable returns in a volatile geopolitical climate. Overall, the article stresses the importance of understanding the relationship between geopolitical risks and the financial capital market, as it can be a key determining factor for the value of stocks, the behavior of market players, and other aspects of the financial capital market in the modern era, including in light of recent events in 2022-2023.

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