



ESG RISKS IN THE ACTIVITIES OF INTERNATIONAL BANKING GROUPS: EVIDENCE FROM UKRAINE

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Abstract

The relevance of this research is driven by the growing significance of environmental, social, and governance (ESG) factors in the financial sector, particularly in the context of globalization and climate change. The Ukrainian banking sector faces new challenges and opportunities associated with ESG risks, which can substantially affect investment attractiveness and long-term development. Analyzing these risks is crucial for Ukrainian banks to adapt to global standards and ensure the sustainability of their operations.

The main purpose of this article is to study the key features of implementing the social and governance components of ESG risks in the activities of international banking groups, and their impact on the overall current investment climate and long-term economic development. The study examines the impact of ESG risks on the dynamics and pricing of Raiffeisen Bank International shares. As a risk factor, the bank's continued operations in the Russian Federation even after the full-scale invasion have been justified. Using ARMA, GARCH, and Markov-regime switching model (MS-GARCH with 2 regimes), it has been shown that ESG risks affect share prices through changes in profitability and increased volatility.

Keywords

ESG risks, Bank, Banking group, Stock volatility.

Problem statement

Modern banking institutions, in addition to traditional risks like market, operational, and credit risks, are increasingly facing the need to update their risk management policies to account for environmental, social, and governance risks. These factors are crucial for sustainable development and maintaining profitability, given the growing focus on sustainability by external stakeholders and the necessity for businesses to take on social responsibility. Considering these risks is essential when forming strategies and implementing projects to align with global sustainability standards.

Relevance of the chosen topic

The escalation of the military conflict in Ukraine has influenced the operations of international banking groups, especially regarding social and governance risks. Measuring the impact of these risks on the performance of

banking groups is critical to understanding the nature of ESG risks in banks and developing policies for managing and regulating them. Moreover, there is an urgent need to assess the impact of international banking groups' operations on the effective implementation of sanctions policies against terrorist states, which today serve as a major trigger in realizing ESG risks.

Analysis of recent research and publications

In today's world, sustainable development issues are gaining increasing importance for both governments and businesses, particularly international banking groups. Sustainable finance has been recognized as a key factor in transitioning to a greener economy (Arvidsson & Dumay, 2021). An important component of this process is the incorporation of ESG risks into corporate activities, which promotes better risk management and aligns with modern transparency and sustainability requirements.

When discussing ESG, researchers emphasize that these risks may arise both from the transition to a more sustainable economic system and from changing climate conditions (Lee et al., 2016). For the banking sector, incorporating ESG metrics into investment processes alters asset structures, limiting investment opportunities. This includes changes in the financing cost for "brown" projects, which can increase risks and lower investment returns (MacAskill, Roca, Liu, Stewart, & Sahin, 2021).

On the other hand, companies with high ESG ratings reduce their exposure to systemic risk through greater transparency in risk management and corporate governance (Mefteh-Wali, Rais, & Schier, 2022). CSR (Corporate Social Responsibility) plays a vital role in reducing idiosyncratic risk and managing the overall risk of companies (Eriandani & Wijaya, 2021). This allows international banking groups to use CSR as a risk mitigation mechanism, particularly during the transition to a low-carbon economy (Clemente, Corte, & Savelli, 2022).

In addition, ESG risks, especially climatic, social (health care, equality of opportunities), and security risks (cybercrime, wars, terrorist acts), are often intertwined with geopolitical risks that can affect capital markets and portfolio investments (Caldara & Iacoviello, 2022). In the context of Ukraine, this aspect is especially relevant due to increasing geopolitical tensions and economic instability, significantly impacting the operations of international banking groups and their ability to adapt to new conditions.

Despite numerous studies on ESG risks and their impact on financial markets (D'Amato, D'Ecclesia, & Levantesi, 2021), many questions remain unresolved. ESG-related risks remain underexplored, particularly in emerging markets like Ukraine. This knowledge gap opens up new opportunities for further research, especially in assessing the impact of ESG risks on the activities of international banking groups in the Ukrainian market and the development of sustainable finance.

Purpose of the article

The objective of this study is to explore the key features of implementing social and governance ESG risks in the activities of international banking groups, and their impact on the overall current investment climate and long-term economic development.

To achieve this objective, the following tasks have been set:

- Define the essence of ESG risks in the activities of international banking groups and their impact on the credit and operational risks of the bank.
- Develop a framework for understanding how ESG factors influence the activities of international banking groups.
- Assess the impact of social and governance risks on the investment attractiveness of banking institutions.

Presentation of the main research material and results obtained

ESG (Environmental, Social, and Governance) risks are playing an increasingly significant role in financial institutions, particularly in banks. The essence of ESG risks lies in the influence of environmental, social, and governance factors on the business processes of banks and their clients. According to research presented in a KPMG report, banks should consider these risks not only as potential losses but also as opportunities to improve their operations and strengthen their reputation (KPMG, 2021).

The main components of ESG risks include:

1. Environmental risks – related to climate change, such as physical risks (e.g., damage from natural disasters) and transitional risks (e.g., the introduction of new environmental regulations).
2. Social risks – involve issues like social inequality, working conditions, and the impact of companies on society and communities.
3. Governance risks – pertain to corporate governance, corruption, compliance with laws (including tax laws), and operational transparency.

As discussed in the literature review, there is an urgent need to reach a consensus on a standardized ESG framework. The diversity of models complicates the standardization of ESG frameworks. Therefore, before applying specific ESG criteria to individual countries, industries, and companies, general criteria for measuring non-financial ESG-related factors must first be established. In this study, we selected five representative ESG frameworks. Table 1 lists the elements that make up the ESG components from five of the most reliable ESG data providers: Stakeholder Capitalism Metric (World Economic Forum, 2020), SASB (2020), Refinitiv (2021), (MSCI, 2020), and (S&P Global, 2021). These five providers were chosen for their leadership in ESG (Stakeholder Capitalism Metric), standardization (SASB), and recognition in the industry (Refinitiv, MSCI, and S&P Global).

The International Business Council (IBC) published the Stakeholder Capitalism Metric following the World Economic Forum's (WEF) annual meeting in 2020, developed by the four major audit firms: Deloitte, EY, KPMG, and PwC. This metric is based on recommendations from leading global ESG standards, including the GRI (Global Reporting Initiative), TCFD (Task Force on Climate-Related Financial Disclosures), SASB, OECD guidelines, and others. Another ESG data provider, SASB, is one of the most authoritative ESG bodies, alongside the GRI, CDP (formerly Carbon Disclosure Project), and IIRC (Hazelton & Perkiss, 2018). S&P Global, MSCI, and Refinitiv are the most cited providers of economic and financial indices and ratings worldwide (SustainAbility, 2020). These five representative ESG frameworks cover similar aspects of ESG, and the common factors should form the core of ESG.

Table 1: Overview of different approaches to defining ESG factors.

Data Provider	E (Environmental)	S (Social)	G (Governance)
Stakeholder Capitalism Metric	- Availability of freshwater - Climate change - Air pollution - Loss of natural resources - Innovation for products	- Dignity and equality - Health and well-being - Skills for the future - Employment and wealth creation - Community	- Ethical behavior - Managerial purpose - Risk and opportunity review - Stakeholder engagement - Governance quality
SASB	- Energy management - Water management - GHG emissions - Climate change - Waste management - Environmental harm	- Human rights - Human capital - Product quality and labeling - Customer privacy - Cybersecurity - Customer well-being	- Business ethics - Business model resilience - Regulatory environment management - Supply chain management - Risk management
Refinitiv	- Resource usage - Emissions - Environmental strategy - Environmental disputes	- Human rights - Community - Workforce - Product responsibility - Social disputes	- Governance structure - ESG strategy and reporting - Shareholder rights - Governance disputes

MSCI	- Natural resource depletion - Climate change - Pollution and waste - Environmental strategy	- Human capital - Social opportunities - Stakeholder satisfaction	- Corporate behavior - Corporate governance
S&P Global	- Operational eco-efficiency - Climate strategy - Environmental reporting - Environmental policy	- Human rights - Corporate citizenship - Labor practices - Talent retention - Customer relationships - Cybersecurity	- Political influence - Social reporting - Codes of business conduct - Tax strategy - Supply chain management - Risk management

Source: Compiled by the authors based on Stakeholder Capitalism Metric (World Economic Forum, 2020), SASB (2020), Refinitiv (2021), (MSCI, 2020), and (S&P Global, 2021).

Research into social and governance factors of ESG is crucial for assessing the sustainability and responsibility of companies in the modern business environment. These factors influence a company's reputation, its ability to attract and retain talent, build reliable relationships with clients and contractors, and adhere to ethical standards. Analyzing social aspects helps to understand how companies integrate human rights and social responsibility into their strategies, while governance factors indicate leadership effectiveness, risk management, and the interests of shareholders.

Table 2: Key factors in the implementation of social and governance risks in banking institutions.

Criterion	Description	Measurement methods
Human rights	Adherence to and protection of human rights in business practices	Discrimination, harassment, diversity score, freedom of association, child/forced/compulsory labor
Community relations	Efforts to build a strong reputation and relations with local communities	Local investments, community investments
Human resource management	Ensuring dignity, equality, health, and benefits for employees	Talent attraction and retention, provision of health, safety, and training opportunities
Customer satisfaction	Providing products and services that satisfy customers	Data privacy, data security, product safety and quality, financial security of the product
Contractor partnerships	Promoting satisfaction, trust, and inclusive growth with contractors	Contract satisfaction, trust-based relationships
Social and political contribution	As a responsible corporate citizen, efforts to create greater overall value for society	Contributions, philanthropy, infrastructure investments, employment, tax payments
Ethical behavior	Monitoring and managing compliance with current laws and regulations	Anti-competitive practices, anti-corruption and bribery policies
Risk and opportunity management	Identifying and managing strategic risks and opportunities for long-term value creation	Systemic risk management, critical incident management, business model resilience
Shareholder rights and corporate governance	Considering the interests and voice of shareholders in the company's strategy and governance	Return on investment, voting rights, information disclosure
CEO reputation	The influence of the CEO's personality and qualifications on corporate image and value	Gender ratio, board members' experience
CEO reputation	The influence of the CEO's personality and qualifications on corporate image and value	CEO image, governance-related controversies

Source: Compiled by the author based on (Woo & Kim, 2015; Galletta, Goodell, Mazzù, & Paltrinieri, 2023).

ESG risks have the potential to affect both financial and non-financial indicators of banks, such as liquidity and creditworthiness. Banks must integrate ESG risks into their risk management system and implement mechanisms to assess these risks at all levels. This includes developing new stress-testing methodologies to evaluate the impact of climate risks and incorporating ESG factors into product development strategies and client relations.

The impact of ESG (Environmental, Social, and Governance) risks on credit risk is becoming increasingly important in the modern financial system. Companies that do not consider ESG factors in their operations may face long-term risks that negatively affect their creditworthiness. Specifically, environmental risks, such as climate change and resource constraints, can lead to higher operational costs or regulatory restrictions, reducing the company's ability to repay loans.

Social factors include evaluating ethics in workforce management, working conditions, and relations with communities, which can impact a company's reputation and market resilience. Failure to meet social standards may negatively affect operational efficiency and increase legal risks, impacting creditworthiness.

Governance risks pertain to management transparency, leadership quality, and regulatory compliance. Companies with low standards of corporate governance are more likely to face conflicts among shareholders and poor risk management, affecting investor and creditor trust. Integrating ESG factors into the credit risk assessment process allows financial institutions to more objectively evaluate a company's resilience to long-term risks and make informed lending decisions (Mefteh-Wali et al., 2022). ESG risks have the potential to impact both financial and non-financial indicators of banks, such as liquidity and creditworthiness. Banks must integrate ESG risks into their risk management systems and implement mechanisms for assessing these risks at all levels. This includes developing new stress-testing methodologies to evaluate the impact of climate risks, as well as incorporating ESG factors into product development strategies and client relationships.

The impact of ESG (Environmental, Social, and Governance) risks on credit risk is becoming increasingly significant in the modern financial system. Companies that do not consider ESG factors in their operations may face long-term risks that negatively affect their creditworthiness. In particular, environmental risks, such as climate change and resource constraints, can lead to increased operational costs or regulatory limitations that diminish a company's ability to repay loans (Bukreeva & Grishunin, 2024).

Social factors involve evaluating the ethics of employee relations, working conditions, and community engagement, which can affect a company's reputation and market resilience (Yeung, 2011). Non-compliance with social standards can adversely impact operational efficiency and lead to legal risks that affect creditworthiness.

Governance risks relate to management transparency, leadership quality, and compliance with regulatory requirements. Companies with low corporate governance standards are more likely to encounter conflicts among shareholders and poor risk management, which impacts investor and creditor trust. Integrating ESG factors into the credit risk assessment process allows financial institutions to more objectively evaluate a company's resilience to long-term risks and make informed lending decisions (Srivastav & Hagendorff, 2016). In addition to the direct impact of ESG risk implementation in the bank's counterparties on the overall asset quality and credit risk realization, the bank's social and governance policies also influence the investment attractiveness of the enterprise.

Evaluating the impact of social and governance decisions on the investment attractiveness of international banking groups, such as Raiffeisen Bank International, is extremely important in the context of an unstable geopolitical environment. At the beginning of 2022, the bank faced deteriorating long-term sustainability forecasts due to its continued operations in Russia, raising concerns among investors and regulators. To assess such impacts, it is advisable to use econometric models, such as panel regressions, ARMA, GARCH, and the Markov-regime switching model (MS-GARCH with 2 regimes), which allow for identifying correlation dependencies between social and governance decisions and key financial indicators, including stock returns, risk levels, and resilience to external shocks (Mishra, Kumar, & Bal, 2024). This approach not only quantitatively measures the effects of the bank's decisions but also evaluates their impact on long-term investment attractiveness, which is critical for ensuring resilience in conditions of high uncertainty.

Raiffeisen Banking Group (RBI) and its key subsidiary Raiffeisen Bank International (RBI) announced high financial results for 2023, despite economic pressures in key markets and significant risks associated with its subsidiary in Russia. The high profitability and large capital buffers of RBI provide protection against potential losses in Russia. S&P Global Ratings has confirmed the credit ratings of RBI at 'A-' (long-term) and 'A-2' (short-term), but the outlook remains negative due to potential risks associated with the bank's further operations in Russia and Belarus. Regulators, including the European Central Bank (ECB), are increasing pressure on the bank to expedite its exit from these markets. We will summarize information on the key features of RBI's operations in Table 3, identifying key factors of financial condition and the exit policy from the Russian market.

Table 3: Key Investment Attractiveness Indicators of RBI in 2024.

Key Issue	Description
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Financial Stability	RBI increased its total capital by 10% in 2023, which acts as a buffer against unexpected financial losses. The group's profit reached €5.7 billion, and the return on equity (ROE) was 15.4% in 2023.
Russian Operations	Profit from operations in Russia amounted to approximately €1.2 billion (~20% of RBI's total profit), but these funds remain blocked in the Russian subsidiary. This increases risks, particularly amid sanctions and reputational threats.
Real Estate Segment Issues	RBI faced an increase in non-performing assets (NPA) to 3.1% in 2023, compared to 2.3% in 2022, due to stress in the commercial real estate segment, notably the default of the Austrian company SIGNA.
Exit Plans from Russia and Belarus	Exiting these countries could have a significant negative impact on RBI's profits and create uncertainties due to asset valuation risks. For instance, the sale of the Belarusian subsidiary could result in losses of €675 million.
Forecast and Potential Risks	The forecast remains negative due to risks related to operations in Russia and Belarus, as well as potential consequences from the war in Ukraine. Failure to execute plans to exit Russia could lead to a downgrade in the bank's rating.

Source: Compiled by the authors based on ("Results & Reports," n.d.).

Raiffeisen Bank International (RBI) faces significant reputational risks and challenges due to its operations in Russia, which are complicated by prolonged sanctions and regulatory scrutiny. A key issue is the delayed sale of its Russian subsidiary, a process that has already taken more than two years. The sale of this part of the business is a crucial step for the bank to remove its Russian operations from the group's financial reporting and reduce both reputational and sanctions-related risks. These risks arise from the need to manage the interests of various stakeholders, which may be in conflict due to the political and economic situation in the region.

Furthermore, RBI's plan to repatriate excess capital from Russia through dividend payouts was canceled. This was due to the bank's inability to secure sufficient guarantees to meet sanctions compliance and minimize risks from regulators and stakeholders. This adds to the reputational challenges facing the bank, as the failure to complete this process negatively impacts its strategy to exit the Russian market and increases risks to the bank's image on the international stage ("Results & Reports," n.d.).

In this context, the ESG (Environmental, Social, and Governance) assessment plays a critical role in the bank's reputational risks. According to Moody's, RBI has an ESG credit impact score of CIS-2, indicating a moderate impact of environmental, social, and governance factors on its ratings. The greatest risks stem from governance due to prolonged operations in Russia, which pose strategic challenges for exiting the country and increase the risk of sanctions violations. Strict compliance with sanctions laws requires substantial resources for managing compliance risks, which increases the bank's governance burden and could harm its reputation if regulatory requirements are not met. Thus, reputational risks linked to operations in Russia, combined with high ESG standards, create complex challenges for RBI that affect both its financial performance and its reputation in the global market. The negative impact of these reputational risks, stemming from ineffective management policies within the financial group, severely affects the company's investment appeal among portfolio investors, as shown in the analysis of RBI's stock price (Figure 1).



Fig. 1: Closing price and range corridor of the stock price during the trading day.

Source: Compiled by the author based on (YFinance).

ARMA and GARCH models were used to analyze the impact of ESG risks on Raiffeisen Bank International's stock price, allowing a quantitative assessment of the effects of social and governance factors on market dynamics. The ARMA model (AutoRegressive Moving Average) allows analyzing how previous values of returns and innovations affect the current stock returns.

The formula for ARMA(2,1) is as follows:

$$r_t = \phi_0 + \phi_1 r_{t-1} + \phi_2 r_{t-2} + a_t - \theta_1 a_{t-1} \quad (1)$$

where:

r_t is the stock return at time t ,

ϕ_0 is the constant,

ϕ_1, ϕ_2 are autoregressive coefficients for lagged returns,

a_t are random errors (innovations) with a mean of 0 and variance σ^2 ,

θ_1 is the coefficient for the moving average component.

This model allows the assessment of short-term return fluctuations that can be caused by ESG risks, including changes in stock price due to environmental or social events (Mishra et al., 2024). The results of the ARMA(2,1) model for the period from 2018 to the present show the following: the constant (20.65) is statistically significant ($p < 0.001$), indicating a stable average stock price level. The AR(1) parameter is not statistically significant ($p = 0.667$), suggesting a weak impact of the first lag on the current stock price.

The AR(2) parameter is highly significant ($p < 0.001$), indicating a substantial impact of the second lag. The MA(1) parameter is also significant ($p < 0.001$), pointing to a strong influence of previous random errors on the current value. The model has a low Akaike Information Criterion ($AIC = 2182.122$) and Bayesian Information Criterion ($BIC = 2209.350$), indicating adequate model quality for forecasting. Additionally, the model shows a high level of heteroscedasticity (Jarque-Bera = 21349.31), which may suggest significant uneven risk distribution in market dynamics (D'Amato et al., 2021). This is a key factor for assessing ESG risks, as the uneven distribution and high levels of volatility are the result of ESG risk realization, particularly concerning the effectiveness of sanctions policy towards Russia.

To model stock volatility in response to ESG risks, the GARCH model (Generalized Autoregressive Conditional Heteroskedasticity) was applied.

The formula for GARCH(1,1) is as follows:

$$\sigma_t^2 = \omega + \alpha a_{t-1}^2 + \beta \sigma_{t-1}^2 \quad (2)$$

where:

σ_t^2 is the conditional variance at time t ,

ω, α, β are the model parameters,

a_{t-1} are innovations (shocks) at the previous moment,

σ_{t-1}^2 is the past conditional variance.

The GARCH model allows for assessing the stock volatility dynamics of Raiffeisen Bank International depending on previous shocks caused by ESG factors (Di Tommaso & Thornton, 2020). The results of the GARCH(1,1) model for the period from 2018 to the present show the following key points: $\mu = -0.00969$, which is not statistically significant ($p = 0.278$), indicating no significant constant average changes in the stock during this period. $\omega = 0.0059$, which is also insignificant ($p = 0.120$), illustrates the initial level of volatility. $\alpha = 0.0942$, is statistically significant ($p = 0.026$), indicating that past shocks or market changes affect current volatility. This is an important indicator for assessing short-term fluctuations caused by ESG risks.

$\beta = 0.874$, is highly significant ($p < 0.001$), indicating that volatility remains high over time. A high β value suggests that risks have a long-term effect on the market. The model shows a low AIC value (1713.53) and BIC (1735.31), indicating the effectiveness of the approach for data analysis. A high β value means that ESG risks, if they impact the market, can cause long-term volatility and uncertainty, which is important for investors when assessing risks.

Conditional volatility estimates were calculated and demonstrated in Figure 2, where a clear increase in volatility is tracked during the realization of ESG risks.

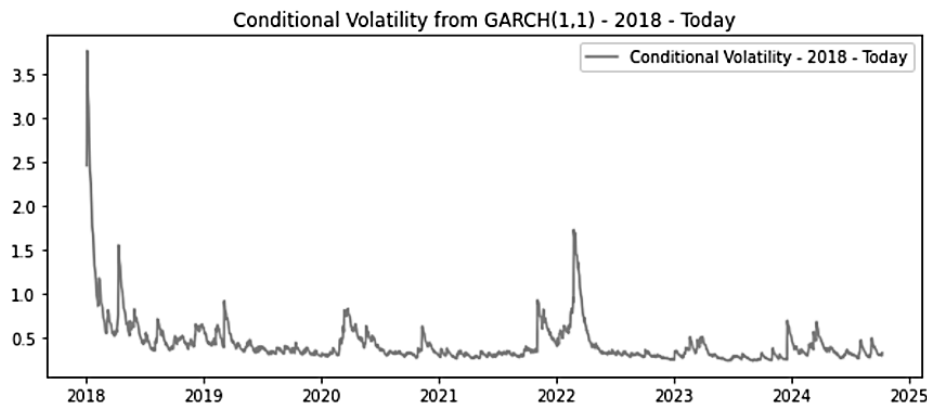


Fig. 2: Conditional volatility of RBI stock according to GARCH(1,1).

Source: Compiled by the authors based on own calculations.

To confirm this hypothesis and assess the likelihood of crisis events impacting the investment attractiveness of Raiffeisen Bank International, we next consider a Markov regime switching model, defining two regimes and evaluating time series parameters using GARCH(1,1), which helps assess the change in time series volatility. The model allows us to detect changes in investment attractiveness behavior depending on different economic regimes, such as high and low volatility levels (Wu, Li, Cao, & Xu, 2024).

For each period, the regime switches according to the following transition probability matrix:

$$P(S_t = s_t | S_{t-1} = s_{t-1}) = \begin{bmatrix} p_{00} & p_{10} \\ p_{01} & p_{11} \end{bmatrix} \quad (3)$$

where p_{ij} is the probability of transitioning from regime i to regime j .

The determined values of logarithmic returns and the probability of being in a high-volatility regime (a key trigger for risk realization and their negative impact on investment attractiveness) are shown in Figure 2. Historical analysis supports corresponding observations of the probability of a high-volatility regime in 2020 during the Covid-19 crisis and worsening financial conditions in 2018.

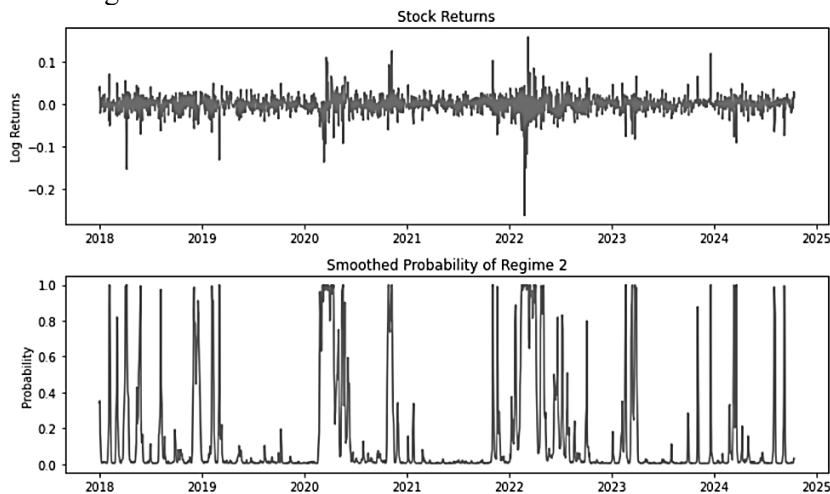


Fig. 3: Daily logarithmic return of RBI.VI and corresponding probability of high-volatility regime in the respective period.

Source: Compiled by the authors based on own calculations.

The probability of remaining in a low-volatility market is 96.87%. This means the market has a very high chance of staying stable and not experiencing significant fluctuations, even after minor shocks. The probability of transitioning from a high-volatility market to a low-volatility market is 19.73%. This indicates that when the market enters a period of high volatility, there is a chance of returning to stability, but it is not very high. Therefore, the consequences of ESG risk realization have a long-term impact on the overall condition of Raiffeisen Bank International.

We additionally forecasted the asset's price by comparing two time intervals: before and after the occurrence of management and social risk realization in the aggressor country and the key trigger of the 21st-century geopolitical crisis. The forecasting results using ARMA(2,1)-GARCH(1,1) are presented in Figure 4.

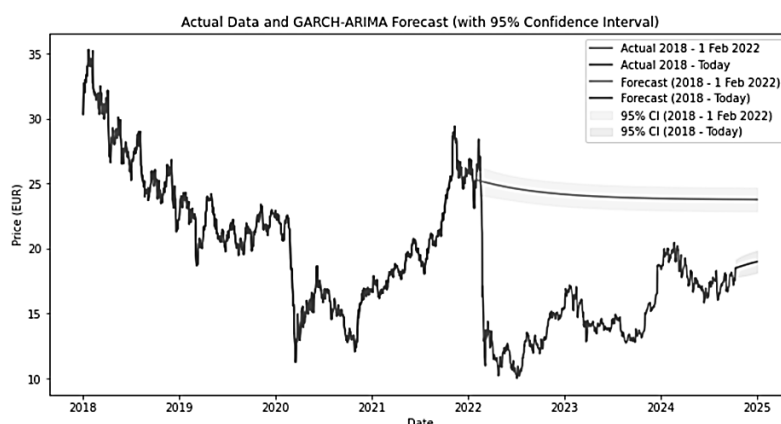


Fig. 4: RBI.VI price forecast results using ARMA(2,1)-GARCH(1,1) with pseudo-forecasting of the asset price before ESG risk realization.

Source: Compiled by the authors based on own calculations.

The obtained results from the ARMA(2,1)-GARCH(1,1) models show that ESG risks affect stock prices by changing returns and increasing volatility. During the realization of ESG risks, greater instability is observed in market valuations, which in turn affects the stock's investment attractiveness and creditworthiness.

Conclusions

In modern conditions, environmental, social, and governance (ESG) risks play an increasingly important role in the activities of international banking groups, particularly Raiffeisen Bank International (RBI). The study confirmed that ESG risks can significantly impact stock price volatility, investment attractiveness, and the bank's financial stability. One of the key risk factors for RBI is its continued operations in Russia after the onset of the military invasion, which has raised concerns among investors and regulators. The use of ARMA and GARCH models allowed for a quantitative assessment of the impact of ESG risks on the bank's stock returns and increased volatility. It was established that stock volatility rises in response to the realization of ESG risks related to social and governance factors. Furthermore, the study showed that RBI's prolonged presence in the Russian market and the associated reputational risks present a significant challenge for the bank, reducing its investment attractiveness. This is supported by the results of econometric analysis, which demonstrated significant changes in the bank's financial performance due to the influence of ESG risks. Thus, for international banking groups like RBI, it is becoming critically important to take ESG factors into account in the risk management process and strategy development.

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