UDC 339.9
DOI: 10.56318/eem2024.02.019

Valentyna Cherviakova*
PhD in Economics, Associate Professor
National Transport University
01010, 1 M. Omelianovych-Pavlenko Str., Kyiv, Ukraine
https://orcid.org/0000-0003-3568-3836

Tetiana Cherviakova
PhD in Technical Sciences, Associate Professor
National Transport University
01010, 1 M. Omelianovych-Pavlenko Str., Kyiv, Ukraine
https://orcid.org/0000-0002-3672-9173

Organisational support for the functioning of enterprises in the context of geopolitical turbulence

Abstract. The aggravation of political confrontation and economic competition between the world's leading powers has led to the destruction of established international relations, armed conflicts, the introduction of sanctions, financial instability, and restrictions on trade and cooperation in the technological sphere, which significantly increases the complexity of conducting both local and international business. Since geopolitical risk is a relatively new and serious challenge for companies, there is a problem of investigating its theoretical aspects and developing organisational and methodological approaches to managing it at the level of business entities. This paper was devoted to the investigation of the essence of geopolitical risk, approaches to its classification, assessment, and accounting in the financial and economic activities of enterprises. The authors' definition of geopolitical risk is formulated and its classification by forms of manifestation is proposed. A critical review of methodological approaches to quantitative and qualitative analysis of geopolitical risks was carried out. Analysis of the relationship between the levels of the geopolitical risk index and some macroeconomic indicators of Ukraine showed that the variation in the levels of gross external debt depends on the geopolitical risk index of Ukraine by 88%, the consumer price index – by 86%, direct investment from Ukraine – by 84%, direct investment in Ukraine – by 76%, the gross domestic product of Ukraine – by 90%, the official exchange rate of the UAH against the USD – by 98%. The obtained dependencies allow predicting the behaviour of economic entities depending on the dynamics of the level of geopolitical risk and developing appropriate response scenarios. Based on the recommendations of risk management experts on ensuring the functioning of enterprises in the context of geopolitical turbulence, a list of measures is proposed that companies should take to anticipate and properly consider changes in the geopolitical situation and effectively counteract the associated risks

Keywords: geopolitical risk; uncertainty; multipolarity; correlation; risk management; diversification

INTRODUCTION

In the modern world, the geopolitical landscape is becoming increasingly complex, which directly affects the economy. The traditional foundations of peace and prosperity have been undermined by a number of geopolitical events and economic phenomena, including the ongoing (as of 2024) conflicts in Ukraine and the Middle East, debt crises in the public finances of developed countries, accelerating inflation, problems with bank liquidity and stability, technological breakthroughs (especially in the field of artif), the transformation of the labour market and the global

Article's History:
Received: 13.08.2024
Revised: 05.11.2024
Accepted: 17.12.2024

Suggested Citation:
Cherviakova, V., & Cherviakova, T. (2024). Organisational support for the functioning of enterprises in the context of geopolitical turbulence. *Economics, Entrepreneurship, Management*, 11(2), 19-33. doi: 10.56318/eem2024.02.019.

*Corresponding author

struggle for talent in the digital economy. In this changing environment, national security priorities and political intervention, especially among the world's leading powers, are increasingly influencing the future of global trade, supply chains, and economic integration. In addition, elections in at least 64 countries in 2024 could have a significant impact on the global economy, not only because of changes in trade and investment policies, but also because of growing uncertainty and political polarisation. Current geopolitical developments can change traditional supply chains and investment areas, which will lead to increased costs for companies. Highly integrated and complex supply chains, which until recently were considered the achievement of free trade and economic efficiency, are now often seen as vulnerabilities requiring strategic adjustments in the face of escalating geopolitical competition.

Quite a lot of attention was paid to the study of geopolitical risks. The researchers examine the essence, underlying causes and consequences of global risks for society, the state and enterprises, present various approaches to their classification and assessment, and offer theoretical foundations and practical recommendations for their management. In the monograph by L. Skokova (2021) thoroughly examines the conceptual foundations of risks, their systemic nature and modern manifestations in an unstable society. The close relationship between politics, government, and risks is emphasised and key areas of global risks are outlined. Special attention is paid to the study of information sphere risks associated with media and social networks, identification of problems of electronic democratisation, and socio-cultural features of risk perception.

A. Stavytsky (2018) examined in detail how changes in the geopolitical environment in the world create risks and threats to both the country's economy and its economic security. The paper considers possible risks caused by geopolitical confrontation between states and blocs of countries, economic prerequisites for conflicts, and the struggle for resource and energy support. The researcher states that geopolitical challenges will significantly affect the economic component of the countries for quite a long time and this will be especially critical for Ukraine, which, due to the limitations of its economy, cannot play a significant role in the international arena, and its transit position in Europe will remain the subject of geopolitical struggle. O. Herasymenko (2021) thoroughly investigated the problems of risk-based management in the system of economic security of an enterprise. The researcher proposed the concept of risk-oriented management in the system of economic security of the enterprise and developed a methodology for risk-oriented assessment of the level of economic security of the enterprise, which combines the mathematical apparatus with the use of expert assessment to determine key risk indicators.

A number of empirical studies are devoted to the investigation of the relationship between the level of geopolitical risk in the world and key macroeconomic indicators. Thus, the study by V. Mignon & J. Saadaoui (2024) on the relationship between the level of geopolitical risk and oil prices shows that increased geopolitical risks raise oil prices due to fears of supply disruptions. O.F. Tan *et al.* (2022) found that in conditions of uncertainty caused by geopolitical risks, investment activity at the level of enterprises and countries decreases, since economic entities tend to take a risk-averse stance, maintaining cash reserves for investment after the risks are eliminated. D. Caldara *et al.* (2024) based on a study of historical data from a large group of countries over more than a century, found that geopolitical risks increase global inflation due to their impact on financial markets. However, the impact of geopolitical shocks on the inflation rate is multifaceted, including adverse events both from the supply side (supply disruptions, a decline in international trade and an increase in the cost of goods) and from the demand side (a decrease in consumer confidence and tougher financing conditions), and regulatory effects characterised by expansionist fiscal and monetary policy measures. A.I. Kaya & L. Erden (2023) and M.S. Pagliari & S.A. Hannan (2024) noted the significant impact of geopolitical risks on international capital flows. Z. Lu *et al.* (2020) substantiated the negative impact of geopolitical risks on the level of domestic lending to the private sector in developing countries.

Many papers are devoted to the study of the impact of macroeconomic indicators of countries on the development of their policies and vice versa. It was established that the results of economic policy of states have a significant impact on political processes, forming public opinion, electoral preferences, and voter behaviour. B. Marx *et al.* (2022) state that positive macroeconomic trends, such as sustained growth in gross domestic product (GDP), lower unemployment, and moderate inflation, contribute to the support of current political leaders and parties. Conversely, adverse economic phenomena and processes, in particular, high levels of unemployment, inflation and corruption, cause public discontent and stimulate the growth of electoral activity to change political elites (Frank & Martínez i Coma, 2023). Based on the results of the study by M. Funke *et al.* (2023), political populism at the national level has reached a record high – more than 25% of countries are under populist leadership. The analysis shows that under the rule of a populist government, GDP per capita in a 15-year perspective will be on average 10% lower than it could be under the rule of a pragmatic government, since populist rule is usually accompanied by economic disintegration, reduced macroeconomic stability, and erosion of state institutions. The study by M. Giuliani & S.A. Massari (2019) shows that economic downturns cause changes in the political system of states, causing alternating victories of left and right political forces. H. Kriesi & S. Hutter (2019) proved that left-wing and right-wing populist parties, as well as radical political forces and leaders, benefit most from economic difficulties, while support for major parties decreases.

Despite the significant achievements in the study of various aspects of geopolitical risks, there are practically no research on the relationship between the level of geopolitical risk and the macroeconomic indicators of Ukraine

and the financial results of enterprises. The problems of identifying, assessing, analysing, and predicting geopolitical risks at the macro and micro levels also remain unresolved. Insufficient attention is paid to the features of enterprise management in the context of a changing geopolitical landscape. Due to the aggravation of geopolitical contradictions, the risks of doing not only international, but also local business have significantly increased. The purpose of this study was to investigate the impact of geopolitical risks on the economy of Ukraine and to develop recommendations for the management of enterprises in the context of the redistribution of traditional spheres of geopolitical influence and the establishment of new economic blocks.

MATERIALS AND METHODS

The research was based on open and independent sources of information. During the study, general scientific methods were used: analysis, synthesis, generalisation, systematisation, graphic. Based on the approaches outlined in the papers analytical reports of international organisations and consulting firms, the authors' definition of geopolitical risk and its classification were proposed. Data by D. Caldara *et al.* (2024) was used to calculate the average annual values of the global geopolitical risk index (GPR) and the geopolitical risk index of Ukraine (GPR UKR). The values of Ukraine's macroeconomic indicators for 2003-2023 were taken from the Official Website of the National Bank of Ukraine (n.d.).

The study of the relationship between the levels of the geopolitical risk index and some macroeconomic indicators of Ukraine was carried out based on the correlation and regression analysis of data presented in the form of two samples X and Y of the same volume n. Pearson's correlation coefficient (linear pairwise correlation coefficient r) was used as a measure of the correlation between attributes X and Y (Holikov, 2006). The Pearson's correlation coefficient helped to estimate the strength and direction of the linear relationship between attributes X and Y. For linear regression, the correlation coefficient r was not only a criterion for the closeness of the relationship, but also a criterion for the accuracy of the approximation. The accuracy of the curved dependence approximation was estimated using a correlation relation (correlation index η). Unlike the linear correlation coefficient, the correlation index did not characterise the direction of coupling. The Cheddock scale was used to convert the quantitative characteristic of the closeness of the correlation relationship between two attributes into a qualitative one.

The significance of the correlation was checked using the Student's t-test. The calculated value of the Student's t-test (t_p) was compared with the critical value of the t-test $t_{cr} = t(\alpha; k)$ at a given value of α and the number of degrees of freedom $k = n - 2$. If $t_p > t(\alpha; k)$, then the correlation is significant at the significance level α (reliability level $p = 1 - \alpha$), which indicates the non-random nature of the statistical relationship between the variables under study. The adequacy of the pair regression model was tested using the Fischer criterion. Actual value of the Fischer criterion F_f was compared with the critical value of Fischer's statistics with 1 and $(n - 2)$ degrees of freedom and level of reliability $(1 - \alpha)$ $F_{cr} = F(1, n - 2, 1 - \propto)$. If $F_f \geq F_{cr}$, then the model is statistically significant (adequate). To estimate what part of the variation (%) of the dependent variable Y was explained by a variation of the factor attribute X (independent variable), the coefficient of determination R^2 was used (Diedenhofen & Musch, 2015).

Statistical analysis of the relationship between the levels of the geopolitical risk index and some macroeconomic indicators of Ukraine was carried out using the modules Basic Statistics/ Tables, Multiple Linear Regression and Advanced Linear/Nonlinear Models of the Statistica Software Suite (Lupan *et al.*, 2015). Critical values of statisticians were determined using the Probability Distribution Calculator – Distributions (Toptunova *et al.*, 2008). Based on the systematisation of recommendations of leading experts in the field of risk management to ensure the functioning of enterprises in conditions of geopolitical turbulence, a list of measures that companies should take to successfully counteract the destructive impact of geopolitical risks was proposed.

RESULTS AND DISCUSSION

The term "geopolitics" unites a wide range of international relations related to ensuring states' national interests, and includes such multidimensional phenomena and processes as the formation of military-political and economic alliances of states and supranational institutions, changes in the political orientation of individual states, populism, international competition for resources and competition for global leadership, military conflicts, terrorist threats, climate and demographic crises, and any events that can cause regional or global consequences (Kaya, 2024).

S&P Global (2024) defines geopolitical risk as a set of risks arising from interactions between countries, covering trade relations, security partnerships, economic alliances, multinational climate initiatives, supply chains, and territorial disputes that have significant commercial implications, such as sanctions and self-sanctions, reputational risks, trade wars and protectionism, supply chain reconfiguration, and global economic and financial instability. The International Monetary Fund (2023) notes that the global economy can be affected by geopolitical events both directly and indirectly through financial and trade channels, and commodity prices. In financial markets, this affects both direct capital controls or financial sanctions, and increased uncertainty, increased risk premiums, or jumps in asset prices.

In the face of geopolitical tensions, the global economy suffers from higher inflation, lower economic growth, and significant losses to public welfare. The introduction of politically driven trade restrictions disrupts global trade flows and destroys established supply chains even in foreign countries. Rising market prices for key raw materials, their shortage, complications and rising transportation prices lead to a downward trend in industrial production around the world. A potential downturn in globalisation, characterised by an economic divide between conventional

East and West, could lead to a decline in wealth of up to 12% in low-income regions, as they will benefit less from the spread of technology from richer regions. Therefore, it is important for the lowest-income countries to maintain open trade relations with all economic blocs (Góes & Bekkers, 2022).

Since the second half of the 20th century, free trade has largely shaped the global economy. However, geopolitical differences and conflicts are increasingly prompting national governments to raise customs tariffs and use industrial policies to boost national economic development and increase competitiveness. As a result, economic ties are being severed and trade routes are being redrawn. Geopolitics began to have a significant impact on global trade after the USA-China tariff war broke out in 2018. Since then, there has been a redistribution of global trade flows under the influence of geopolitical forces, which is reflected in the growing importance of geopolitical distance as a barrier to trade. Such researchers as C. Bosone *et al.* (2024) state the emergence of friend-shoring instead of near-shoring, that is, the tendency to trade with counterparties from friendly, rather than nearest countries, and provide evidence that now global trade actors are guided primarily by geopolitical considerations, rather than profit-oriented strategies, when choosing partners.

Given the above, the study formulates the definition of geopolitical risk as the probability of adverse events caused by political and economic processes in the international arena (military conflicts, establishment of new military-political and economic alliances, logistics routes, supply chains, markets, investment flows, and sanctions, terrorism, cyber-attacks, climate and migration crises, etc.) that have a significant impact on the economic, social and security situation in individual countries, regions, industries and have implications for state and corporate interests. Since geopolitical risk is a multidimensional phenomenon and can take on various manifestations, there is no consensus among researchers about their classification. Thus, S&P Global (2024) classifies geopolitical risks into several interrelated and often cross-sectional categories (Table 1).

Table 1. Main types of geopolitical risks and their characteristics

Types of geopolitical risks	Characteristics
Political	Impact of political decisions, instability, or conflict on economic and social conditions, such as changes in public policy, civil unrest, and corruption
Economic	Impact of economic and industrial policies, trade disputes, or financial instability on the global economy, including currency fluctuations, inflation, trade wars, and sanctions
Environmental	Impact of natural disasters, climate change, and resource scarcity on the socio-economic situation of states and regions
Regulatory	Changes in the regulatory framework or legal systems for businesses operating in different countries, such as changes in tax, labour, or environmental standards
Cyber risks	Impact of cyber-attacks, data leaks, and other forms of cybercrime, such as ransomware attacks, hacker attacks, and intellectual property theft
Security	Cross-border and internal conflicts with international consequences
Risks of competition for resources	Problems with food and energy security, and with the supply of important minerals

Source: compiled by authors based on S&P Global (2024)

S&P Global (2024) considers the main geopolitical risks worth paying attention to in 2024, tensions between Russia and NATO, cyber-attacks, strategic competition between the United States and China, considering anti/deglobalisation, climate risks, and energy security. There are other approaches to determining the list, time horizon, and scale of geopolitical risks. For example, BCG has developed four scenarios for the possible development of the geopolitical landscape in the coming years (Gilbert & Lang, 2024):

- The "back to the future" scenario. Major world powers are once again taking advantage of enhanced cross-border cooperation and minimal military conflict. Free trade and multilateral institutions remain dominant, enabling constructive cooperation on global issues such as the climate crisis.
- The "spread of regional conflicts" scenario. Targeted military conflicts spread with the limited involvement of major powers. Global institutions struggle for relevance, supply chains are affected by chaos, and the risk of commodity price fluctuations increases.
- The "multipolar rivalry" scenario. Several blocks and groups of countries co-exist in a new global dynamic, where great powers avoid direct conflict, norms and institutions differ between blocs, and trade routes are reformatted to meet new political and economic realities.
- The "global escalation" scenario. The most threatening scenario is in which economic and military confrontations occur in many regions with the deep involvement of major powers. Global institutions are becoming incapacitated, the risks of cyber-attacks and the use of artificial intelligence as weapons are growing, and failures in the global economy are becoming catastrophic.

As of 2024, BCG considers a "multipolar rivalry" scenario to be the most likely, but this estimate may change at any time. Some sources do not distribute geopolitical risks based on certain characteristics, but provide lists of them that are relevant at the current time (Table 2).

Table 2. Current lists of geopolitical risks

List of risks from Eurasia Group specialists	List of risks from BlackRock analysts
The 2024 USA election, which will be a test of American democracy	Strategic competition between the USA and China
The crisis in the Middle East, which has an extremely high risk of escalation	Global technological separation between the USA and China
The actual partition of Ukraine as a result of the war	The Russia-NATO conflict over the war in Ukraine, which is becoming prolonged and increases the risk of escalation outside Ukraine
Breakthroughs in artificial intelligence that will outpace efforts to regulate it	Tensions in the Persian Gulf that threaten energy infrastructure
Rapprochement and mutual support between Russia, Iran, and North Korea	Large-scale terrorist attacks that result in significant human and commercial losses
Weak dynamics of the Chinese economic recovery	Large-scale cyber-attacks that cause long-term failures in critical physical and digital infrastructure
Escalating struggle for important minerals due to trade restrictions	Political crisis in developing countries
The global inflationary shock, which began back in 2021 and will continue to have a slowing impact in 2024	Conflict between North and South Korea
Climate change, which will cause food and water shortages in some regions of the world, disrupt logistical support, promote the spread of diseases and fuel migration processes	Climate policy impasse as advanced economies are unable or unwilling to increase public investment or take steps to meet their emission targets
Limiting the autonomy of decision-making by companies and increasing the cost of doing business	The fragmentation of Europe caused by the energy crisis and inflationary pressures that have led to a resurgence of populist political forces and economic instability

Source: compiled by the authors based on I. Bremmer & C. Kupchan (2024) and T. Donilon *et al.* (2024)

Considering the above, it is advisable to propose such a classification of geopolitical risks by forms of manifestation:

- political (changes in the political regime and course in individual countries associated with making political decisions under pressure from external actors or circumstances without proper economic justification and analysis of the consequences);
- military (internal and international military conflicts, building up conventional and developing new types of weapons, the emergence of weapons of mass destruction in individual countries, the deployment and movement of long-range weapons, conducting military tests and exercises, etc.);
- financial (loss of confidence in traditional financial instruments, markets and institutions, fragmentation of the global financial system, diversification of international settlement forms, etc.);
- economic (increased competition between countries and corporations for access to all types of resources, control of transport corridors, attracting talent, capital and stimulating entrepreneurship);
- legal (changes in the legislative and regulatory regulation of financial and economic activities of business entities and international trade by individual countries that complicate or restrict further cooperation in certain areas);
- security (large-scale terrorist attacks, revolutions, mass protests and riots, strikes that harm the public and private sectors);
- infrastructure (destruction or damage to critical infrastructure as a result of sabotage, cyber-attacks, or military operations, which causes long-term negative consequences, large losses, and requires significant recovery efforts);
- social (increasing unemployment due to automation, closure or relocation of industries, increasing middle-class poverty in developed countries, increasing inequality in access to public goods, stratification of society on various grounds that lead to an increase in social tension and provoke civil conflicts);
- demographic (changes in the number and structure of the population in individual countries and regions, migration processes caused by crisis phenomena in certain countries that create significant pressure for host countries to accommodate and adapt new residents);
- environmental (changes in policies regarding the production and use of minerals, energy generation, emissions, etc., which have long-term consequences for states, businesses, and the population).

As can be seen from the above lists, geopolitical risk is a multidimensional phenomenon that can take on various forms and scales with corresponding consequences not only for the state, but also for the corporate sector. According to a global survey by Oxford-GlobeScan Corporate Affairs (Geopolitical uncertainty..., 2024), corporate affairs professionals are increasingly concerned about the impact of geopolitical conflicts and tensions on business. This is the fifth annual Oxford-GlobeScan Global Corporate Affairs survey, which provides an up-to-date overview of opinions, trends, and challenges in corporate relations. This survey, which was conducted from February to April 2024, involved 227 senior professionals from 43 countries, covering issues and topics related to their position. The results show that geopolitical risk and uncertainty are once again the largest short-term risk category for global business, rising to the top in 2022 with the

outbreak of war in Ukraine. The perceived threat to business due to geopolitical factors increased dramatically in 2024 as the conflict in the Middle East escalates, with 70% of respondents identifying geopolitical uncertainty as the biggest risk to business over the next two years. Climate change and the macroeconomic impact on businesses also remain significant risk factors, although concerns about them have eased slightly over the past year. There is a significant increase in concerns about business risks associated with growing populism and social polarisation, and the impact of artificial intelligence and new technologies (Fig. 1).

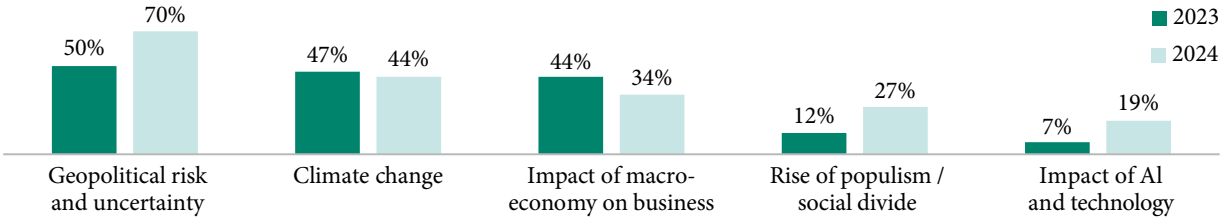

Figure 1. The biggest risks for global business during 2023-2024
Source: Geopolitical uncertainty as risk to business (2024)

Thus, in modern conditions, rapid identification and analysis of geopolitical risks at the global, state and corporate levels using various approaches and methods is an extremely urgent problem. The most well-known and commonly used indicator of geopolitical risk is the geopolitical risk index (GPR), which is based on the frequency of articles in leading newspapers that discuss adverse geopolitical events such as wars, terrorism, and international tensions in the world and in individual countries (Caldara & Iacoviello, 2022). The dynamics of the average annual values of the global geopolitical risk index (GPR) and the geopolitical risk index of Ukraine (GPR UKR) for 2003-2023 is shown in Figure 2.

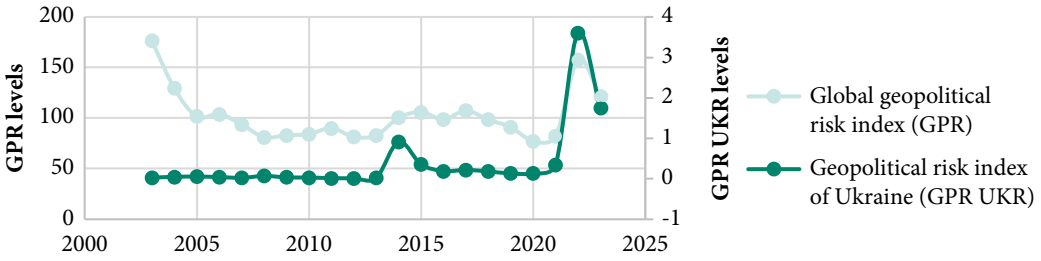

Figure 2. Dynamics of the average annual values
of the global geopolitical risk index (GPR) and the geopolitical risk index of Ukraine (GPR UKR)
Source: compiled by the authors based on D. Caldara & M. Iacoviello (2022)

Given that there is a correlation between the levels of the geopolitical risk index of Ukraine and the levels of the global geopolitical risk index (Fig. 3), a statistical analysis of the relationship between the levels of the geopolitical risk index of Ukraine and some macroeconomic indicators was carried out, namely: gross external debt, consumer price index, direct investment in Ukraine, direct investment from Ukraine, GDP of Ukraine, the official exchange rate of the UAH against the USD. The initial data are presented in Table 3.

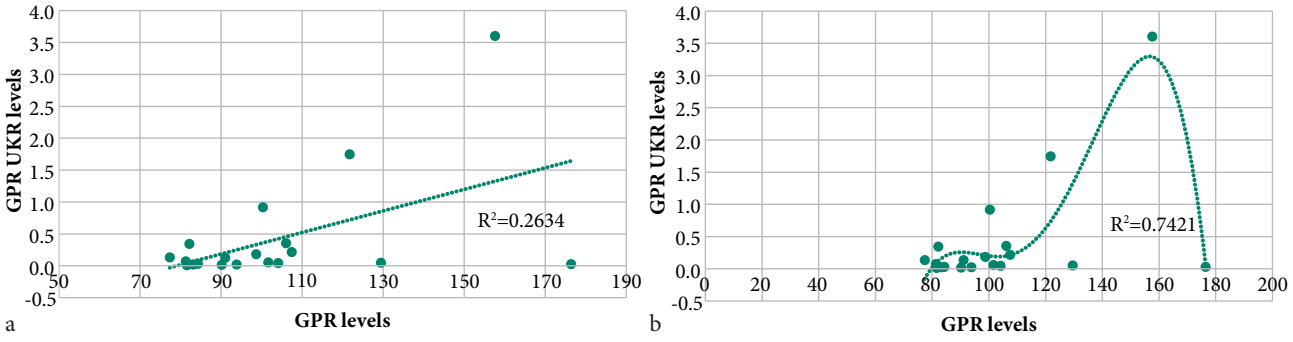

Figure 3. Dependence of Ukraine's geopolitical risk levels on the levels of the global geopolitical risk index
Notes: a) – linear; b) – nonlinear
Source: compiled by the authors

Table 3. Initial data for analysing the relationship between the levels of the geopolitical risk index and some macroeconomic indicators of Ukraine

Years	Indicators							
	Gross external debt, million USD	Consumer price index (December to December of the previous year, %)	Direct investment in Ukraine, million USD	Direct investment from Ukraine, million USD	Ukraine's GDP, million USD	Official exchange rate of the UAH against the USD (average for the period), UAH/USD	GPR	GPR UKR
2003	23,811.0	8.2	1,424.0	-1,411.0	52,010.4	5.33	176	0.029
2004	30,647.0	12.3	1,715.0	-1,711.0	67,220.2	5.32	129	0.050
2005	39,619.0	10.3	7,808.0	-7,533.0	89,238.9	5.12	102	0.056
2006	54,512.0	11.6	5,604.0	-5,737.0	111,884.8	5.05	104	0.045
2007	80,257.0	16.6	9,891.0	-9,218.0	148,733.9	5.05	94	0.024
2008	101,743.0	22.3	10,913.0	-9,903.0	188,110.4	5.27	81	0.072
2009	103,432.0	12.3	4,816.0	-4,654.0	121,552.2	7.79	83	0.037
2010	117,346.0	9.1	6,495.0	-5,759.0	141,209.2	7.94	84	0.032
2011	126,236.0	4.6	7,207.0	-7,015.0	169,333.8	7.97	90	0.018
2012	134,625.0	-0.2	8,401.0	-7,195.0	182,591.8	7.99	81	0.015
2013	142,079.0	0.5	4,499.0	-4,079.0	190,498.8	7.99	83	0.023
2014	125,297.0	24.9	410.0	-299.0	133,503.9	11.89	100	0.918
2015	117,668.0	43.3	-331.0	236.0	91,031.0	21.84	106	0.358
2016	112,524.0	12.4	4,055.0	-3,955.0	93,355.9	25.55	99	0.193
2017	115,451.0	13.7	3,727.0	-3,446.0	112,090.5	26.60	107	0.219
2018	114,710.0	9.8	4,732.0	-4,859.0	130,891.1	27.20	99	0.184
2019	121,739.0	4.1	6,017.0	-5,175.0	153,883.0	25.85	91	0.132
2020	125,682.0	5.0	-36.0	58.0	156,617.7	26.96	77	0.135
2021	129,713.0	10.0	7,320.0	-7,518.0	199,765.9	27.29	82	0.345
2022	130,958.0	26.6	531.0	-187.0	161,989.5	32.34	158	3.609
2023	161,533.0	5.1	4,718.0	-4,676.0	178,757.0	36.57	122	1.748

Source: compiled by the authors

Based on the presented data, a linear correlation and regression analysis of the data was performed – the strength and direction of the correlation relationship were established and its qualitative assessment was made (Table 4). These data indicate that the linear correlation between the levels of the geopolitical risk index of Ukraine and the indicators under study, except for the official exchange rate of the UAH against the USD, is weak and statistically insignificant according to the Student's t-test with a probability of 95% $t_p < t_{0,05;\,n-1}$ ($t_p < 2.0930$). Since the strength of the paired correlation relationship is significantly affected by the form of the relationship (linear, nonlinear), a nonlinear correlation and regression analysis of the relationship between the levels of the geopolitical risk index of Ukraine and the studied indicators was carried out. Statistical analysis was carried out on sections of the time series that characterise certain political and economic conditions: until 2008 – growth in the world and Ukrainian economy; 2009-2015 – inter-crisis period, which covers the world economic crisis, post-crisis correction and the beginning of the war in Ukraine; since 2016 – a period of gradual recovery. The summary results of linear and nonlinear correlation and regression analysis of the relationship between the levels of the geopolitical risk index of Ukraine and the indicators under study are shown in Table 5.

Table 4. Characteristics of the linear correlation between the levels of the geopolitical risk index of Ukraine and the indicators for 2003-2023

Indicator	Number of observations n	Correlation coefficient r	Student's t-test		Qualitative characteristics of communication
			t_p	t_{cr}	
Gross external debt, billion USD	21	0.3507	0.5725	2.0930	weak
Consumer price index (December to December of the previous year, %)	21	0.3376	0.5279	2.0930	weak
Direct investment in Ukraine, billion USD	21	0.3732	0.6545	2.0930	weak
Direct investment from Ukraine, billion USD	21	0.3864	0.7056	2.0930	weak
Ukraine's GDP, billion USD	21	0.2149	0.2062	2.0930	practically absent
Official exchange rate of the UAH against the USD (average for the period), UAH/USD	21	0.5573	1.6306	2.0930	noticeable

Source: compiled by the authors

Table 5. Results of nonlinear correlation and regression analysis of the relationship between the levels of the geopolitical risk index of Ukraine and the indicators under study

Indicator	Statistical characteristics		Billing period		
			2003-2008	2009-2015	2016-2023
Gross external debt, billion USD	Communication model $y=f(x)$		$y=6E+08x^4-1E+08x^3+7E+06x^2-217230x+2335$	$y=-484406x^4+639012x^3-185824x^2+6980.7x+66.18$	$y=-12.489x^2+50.805x+110.37$
	Correlation ratio		0.9607	0.9239	0.9367
	Qualitative characteristics of communication		very strong	very strong	very strong
	Student's t-test	t_p	6.6525	4.9885	6.1412
		t_{cr}	2.7764	2.5706	2.4469
	Fischer's criterion	F_f	47.9481	29.1530	42.9796
		F_{cr}	7.7086	6.6079	5.9874
	Coefficient of determination		0.923	0.8536	0.8775
Consumer price index (December to December of the previous year, %)	Communication model $y=f(x)$		$y=13666x^2-1142.7x+33.64$	$y=-168.03x^2+180.49x+0.7794$	$y=7.6373x^3-38.231x^2+45.415x+1.6803$
	Correlation ratio		0.8738	0.9773	0.9313
	Qualitative characteristics of communication		strong	very strong	very strong
	Student's t-test	t_p	3.1410	10.0911	5.8348
		t_{cr}	2.7764	2.5706	2.4469
	Fischer's criterion	F_f	12.9205	106.6071	39.2489
		F_{cr}	7.7086	6.6079	5.9874
	Coefficient of determination		0.7636	0.9552	0.8674
Direct investment in Ukraine, billion USD	Communication model $y=f(x)$		$y=4E+07x^4-9E+06x^3+657291x^2-20946x+240.96$	$y=24.607x^2-29.79x+7.0344$	$y=58778x^6-366426x^5+663258x^4-414487x^3+114347x^2-14390x+677.18$
	Correlation ratio		0.8597	0.9325	0.8221
	Qualitative characteristics of communication		strong	very strong	strong
	Student's t-test	t_p	2.8930	5.3848	2.9073
		t_{cr}	2.7764	2.5706	2.4469
	Fischer's criterion	F_f	11.3257	33.3436	12.5071
		F_{cr}	7.7086	6.6079	5.9874
	Coefficient of determination		0.7390	0.8696	0.6758
Direct investment from Ukraine, billion USD	Communication model $y=f(x)$		$y=2E+10x^5-4E+09x^4+3E+08x^3-1E+07x^2+282737x-2255.8$	$y=-21.868x^2+26.721x-6.4115$	$y=-10.215x^4+55.404x^3-66.98x^2+0.7225x-1.8441$
	Correlation ratio		0.9950	0.9412	0.801436211
	Qualitative characteristics of communication		very strong	very strong	strong
	Student's t-test	t_p	63.1823	5.8644	2.6306
		t_{cr}	2.7764	2.5706	2.4469
	Fischer's criterion	F_f	3,996.0000	38.8212	10.7738
		F_{cr}	7.7086	6.6079	5.9874
	Coefficient of determination		0.9990	0.8859	0.6423
Ukraine's GDP, billion USD	Communication model $y=f(x)$		$y=1E+09x^4-2E+08x^3+1E+07x^2-369817x+3990.4$	$y=-7953.3x^3+10669x^2-3199.1x+233.56$	$y=1201.4x^4-6970.6x^3+10488x^2-3615.9x+467.73$
	Correlation ratio		0.9472	0.9418	0.9625
	Qualitative characteristics of communication		very strong	very strong	very strong
	Student's t-test	t_p	5.5932	5.8970	8.3644
		t_{cr}	2.7764	2.5706	2.4469
	Fischer's criterion	F_f	34.8727	39.2087	75.5217
		F_{cr}	7.7086	6.6079	5.9874
	Coefficient of determination		0.8971	0.8869	0.9264

Table 5. Continued

Indicator	Statistical characteristics		Billing period		
			2003-2008	2009-2015	2016-2023
Official exchange rate of the UAH against the USD (average for the period), UAH/USD	Communication model $y=f(x)$		$y=8E+08x^5-2E+08x^4+2E+07x^3-680547x^2+13990x-105.56$	$y=-65.861x^2+66.54x+6.3432$	$y=-2.4791x^2+11.139x+24.468$
	Correlation ratio		0.9950	0.9946	0.9845
	Qualitative characteristics of communication		very strong	very strong	very strong
	Student's t-test	t_p	63.1823	21.2842	13.5508
		t_{cr}	2.7764	2.5706	2.4469
	Fischer's criterion	F_f	3,996.0000	457.9630	189.4397
		F_{cr}	7.7086	6.6079	5.9874
	Coefficient of determination		0.9990	0.9892	0.9693

Source: compiled by the authors

The obtained data indicate that the correlations between the levels of the geopolitical risk index of Ukraine and, accordingly, the levels of gross external debt, consumer price index, direct investment in Ukraine, direct investment from Ukraine, GDP of Ukraine, and the official exchange rate of the UAH against the USD are significant according to the Student's criterion ($t_p < t_{0,05;n-2}$), and the regression equations are adequate to the actual data according to the Fischer criterion ($F_f \geq F_{cr}$). The degree of influence of the geopolitical index of Ukraine on the variation in the levels of the indicators under study is different. Thus, the variation in gross external debt levels depends on the impact of the geopolitical risk index of Ukraine on average for the entire observation period by 88%, the consumer price index – by 86%, and direct investment in Ukraine – by 76%, direct investment from Ukraine – by 84%, GDP of Ukraine – by 90%, the official exchange rate of the UAH against the USD (average for the period) – by 98% (Fig. 4).

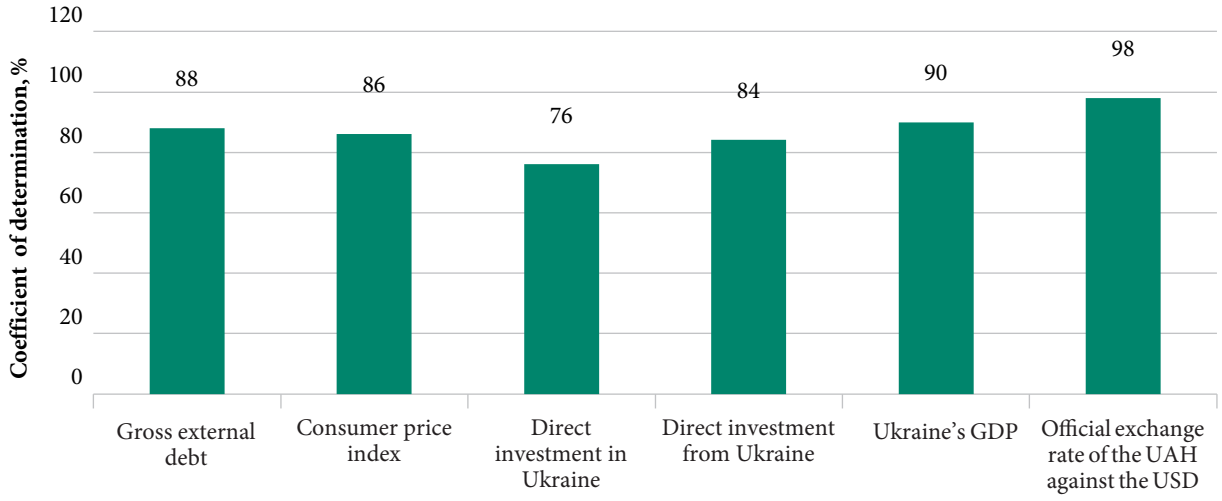

Figure 4. Degree of influence of the geopolitical risk index of Ukraine on the variation in the levels of the indicators under study

Source: compiled by the authors

The dependence of direct investment in Ukraine on the geopolitical risk index of Ukraine at the level of 76% is due to a number of other unfavourable factors of a political, legal and socio-economic nature on the eve of military aggression by the Russian Federation. Therefore, a statistical analysis of the relationship between the levels of direct investment in Ukraine and the levels of the geopolitical risk index of Ukraine was additionally carried out at two intervals – 2016-2020 and 2021-2023 (Fig. 5).

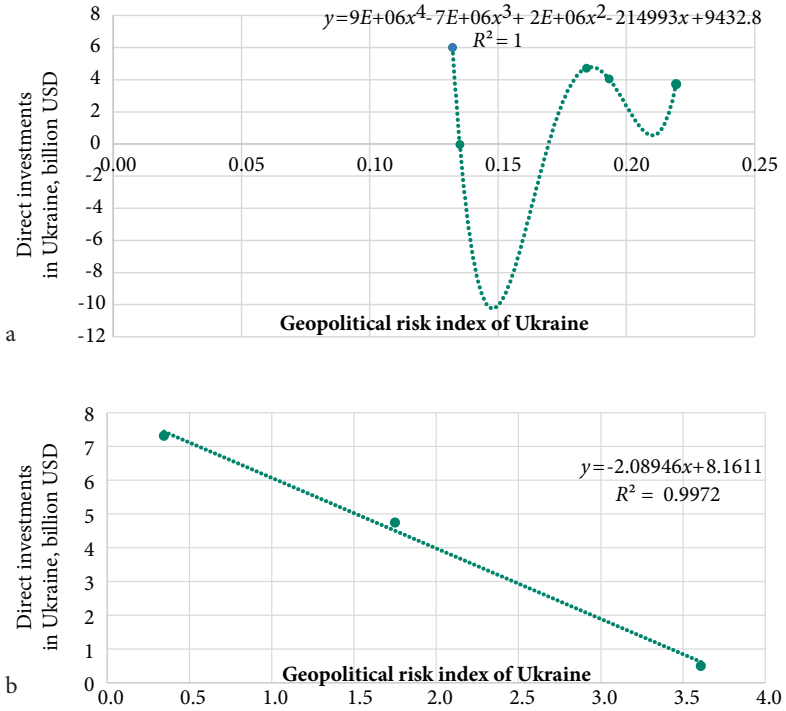

Figure 5. Dependence of direct investment in Ukraine on the geopolitical risk index of Ukraine in different periods
Notes: a) – 2016-2020; b) – 2021-2023
Source: compiled by the authors

The results obtained indicate a functional relationship between the levels of direct investment in Ukraine and the geopolitical risk index of Ukraine in the period 2016-2023. Thus, while the geopolitical risk index (GPR) is easy to use and can be useful for tracking the dynamics of geopolitical risks over time and conducting empirical research, it has certain limitations as a measure of risk. The index states the dynamics of geopolitical risks over past periods, but has no future orientation and cannot predict the potential evolution of risks and the onset of force majeure. The index is a generalised measure of geopolitical risks and is not able to distinguish between individual risks, each of which has different causes, probabilities of occurrence and consequences for countries, markets, industries, and enterprises. The index does not reflect the complexity, duration, sources of occurrence and sustainability of risks, and the non-linear nature of the relationship with macroeconomic indicators, which significantly complicates forecast calculations.

Thus, the geopolitical risk index (GPR) provides only a rough idea of the direction and degree of changes in macroeconomic indicators and is impractical for use in the forecast and analytical activities of enterprises. Therefore, risk analysts typically supplement the GPR index with qualitative analysis, expert advice, probability-based estimates, and scenario analysis to obtain more dynamic and accurate risk assessments. For example, the BlackRock geopolitical risk indicator (BGRI) aims to predict market reactions to geopolitical risks. The indicator represents the average of the top ten risks, including strategic competition between the USA and China, global technological separation, possible conflict between Russia and NATO, tensions in the Persian Gulf, large-scale terrorist attacks and cyber-attacks, political crises in emerging markets, possible conflict in North Korea, a climate policy impasse, and potential fragmentation of Europe (Donilon *et al.*, 2024).

The quantitative components of the geopolitical risk dashboard include two different risk indicators: one is based on the market's attention to risky events, and the other is based on the market's response to these events. BGRI tracks the relative frequency of brokerage reports (via LSEG) and financial news (Dow Jones News) related to specific geopolitical risks. It determines the positive or negative mood in the text of articles and sets points, reflecting the level of market attention to each risk compared to the five-year period. At the same time, brokerage reports are given more weight than other sources of information, since they measure the market's attention to a particular risk, rather than public attention or public opinion. The modified methodology improves on traditional approaches to text analytics, which are based on searching articles for pre-defined keywords for each individual risk. A machine learning-based approach to big data processing is being implemented. Using modern advances in computing technologies, neural network language models are used to analyse large amounts of data and determine the relevance of each sentence to geopolitical risks.

At the initial stage, the prepared language model is filled with content related to geopolitical issues and articles

that reflect various risks. The tuned model performs two main tasks: it classifies the relevance of each sentence to a specific geopolitical risk to get an attention score, and it classifies the tone of each sentence to determine a mood score. These estimates are then aggregated to form a consolidated geopolitical risk assessment. A score of "0" indicates the average level of the BGRI index for the historical period, while a value of "1" indicates that the BGRI level exceeds the historical average by one standard deviation, which means increased market attention to risk. The latter values have more weight when calculating the average value, and the BGRI level changes gradually, even with constant market attention, reflecting the idea of normalising a high level of attention over time.

To assess the market response, market-oriented scenarios associated with each geopolitical risk event are used, which makes it possible to predict the reaction of market prices when certain events occur. First, scenarios are developed and the catalysts for their occurrence (escalation triggers) are determined, after which, using econometric methods, the results of scenarios are converted into potential shocks for market indices and risk factors. The size of shocks is calibrated using a variety of methods, including analysing historical periods that resemble a risk scenario, with more weight given to recent historical parallels. For scenarios that do not have precise precedents, experts in geopolitical risks and portfolio management are involved to conduct additional analysis. Then, for each risk, a market movement index is compiled based on two indicators: similarity – measures how much the current market environment meets expectations for the implementation of a particular scenario, based on the monthly return on the corresponding assets; value – measures the amount of monthly income of the corresponding assets according to a market-oriented scenario.

These indicators are combined to form an index, where:

- a value of "1" indicates that the markets are reacting according to the scenario;
- a value of "0" indicates that there is no correspondence between market behaviour and the scenario;
- a value of "-1" indicates that the markets react in the opposite way to the expected scenario, that is, they place bets against risk.

This approach is particularly useful for investment companies, but it can be used as a basis by enterprises and adapted to the specifics of their own activities. Thus, companies can create and configure their own language model focused on a specific market and risk events to predict demand and prices for raw materials and finished products and develop appropriate response scenarios. However, the implementation and maintenance of this method will require the involvement of qualified specialists in risk management and information technology, and significant financial and time costs for development, testing and improvement.

A multi-level expert approach to geopolitical risk assessment is an appropriate addition to these methods, since it considers the unique characteristics of the company's operating activities to provide an individual analysis of its risks. This approach was described by M.A. De Villa *et al.* (2015), who emphasised the importance of assessing a company's vulnerability to geopolitical risks to identify both threats and new opportunities. For this purpose, a multi-level analysis is used, covering supranational, international, national, industry, and corporate levels. The researchers suggest using various practical questions and information sources to evaluate each factor at these levels.

Thus, at the supranational level, the ability of international organisations to intervene and mitigate political conflicts between states is assessed, which affects the likelihood of escalation of geopolitical risks. At the international level, countries' dependence on raw materials and energy resources, food or technology, which may pose additional risks to companies, is analysed, and political relations between countries that may increase or decrease the consequences of political instability for businesses are examined. At the national level, the political influence of states in the world, due to their technological development and military power, is considered, and the political programmes of governments and their interaction with business, which can increase or decrease political tensions, are evaluated. At the industry level, the impact of military-political conflicts between states on the supply chains and value creation of companies is subject to research. Identifying and considering the interests and expectations of all stakeholders helps to make more informed and effective management decisions. At the level of an individual company, it examines how political tensions can affect its business processes. Special attention is paid to the development of the company's political influence and its ability to lobby its interests to minimise threats or take advantage of opportunities that arise as a result of geopolitical changes.

The application of a multi-level approach to the assessment of geopolitical risk by enterprises takes place in six stages (De Villa, 2023):

1. Collection of information about each risk factor at all levels of analysis, based on practical questions and available sources of information.

2. Analysis of information for each risk factor to determine the level of risk of the company's activities.

3. Estimation of the risk level for each factor using an assessment sheet by assigning a score from 0 to 100, where 0-20 – very low risk, 21-40 – low risk, 41-60 – moderate risk, 61-80 – high risk, and 81-100 – very high risk.

4. Comparison of risk factor estimates and determination of the highest and lowest risk.

5. Identification of potential problems (for factors with the highest risk scores) or opportunities (for factors with the lowest risk scores).

6. Development of strategies to neutralise possible challenges and implement potential opportunities.

Application of this approach will allow companies to conduct an in-depth analysis of their vulnerability to geopolitical risks to make strategic decisions and develop tactics to respond to current challenges and opportunities.

Companies, especially multinational ones, are actively adapting their business plans and operations in response to the growing fragmentation of the global business environment. They geographically diversify supply chains and production activities, create separate divisions to work in different geopolitical blocs, and actively improve risk protection and cybersecurity. M. Gilbert & N. Lang (2024) recommend that CEOs track geopolitical events, strategically plan important changes and ensure that key management tools are up-to-date, and create an organisational structure to respond quickly to geopolitical events. It is recommended:

- Create scripts and develop pointers. Companies should apply geopolitical scenarios to their industry and region of activity to have an idea of the possible development of the business environment in the coming years and create an early warning system for critical business changes.
- Plan a response. Once pointers are installed, companies can develop plans to respond to their appearance. The intuition and expertise of geopolitical risk management specialists will determine the effectiveness of these plans, so the collective experience of the management team in the areas of international relations, global politics, supply chains and risk management, and the involvement of external experts, is important.
- Stay alert. Pointers and scenarios should be updated at least every two years or after major geopolitical incidents to ensure that these tools remain up-to-date.
- Adapt the company's organisational structure for rapid response. In cases of rapid changes and unexpected events, management should have time for complex decisions, such as rescheduling the supply chain or moving staff immediately.

Experts emphasise that the company's geopolitical competencies are not formed instantly. This requires dedication and effort, and can also lead to additional costs. However, these costs will be lower compared to the potential losses if the geopolitical risk is implemented and damages the business.

Experts of the British Certified Institute of Internal Auditors note that the growth of instability, complexity, and pace of change in the new geopolitical era requires the following approaches (Loke & Hayes, 2023): providing flexibility in responding to geopolitical crises and constant readiness; scenario planning and horizon scanning, which involves conducting constant stress tests and updating basic assumptions about the probability and extent of exposure to risks; reviewing professional profiles of risk specialists and internal audit to ensure consistency, communication, coordination, and cooperation between them; adopting a long-term view of geopolitics, which can vary from five years (in the areas of production and service) up to 30 years (in the energy and infrastructure sectors), along with considering geopolitical risks in the short and medium term, as "reliable" countries can change their policies in the future; commitment to the company's goals and values to have a clear understanding of its goal, risk-taking and strategy, while remaining flexible in responding to geopolitical crises; using favourable geopolitical opportunities and increasing the company's growth potential; promptly providing managers with relevant information to make informed decisions.

J. Allen (2024) highlights the growing importance of companies' legal divisions in the context of increasing geopolitical risks. She points out that legal departments should have a deep understanding of geopolitical issues, anticipate their consequences, and be prepared to provide appropriate recommendations to management. To effectively manage a company, the legal department must be involved in the overall business strategy and transformation plans, and the general counsel must understand how the company's growth factors are related to the geopolitical environment.

Geopolitical developments complicate the role of the legal team, requiring consistency between the positions of the board, management, general counsel and responsible public relations officers in different countries. The regulatory environment is becoming increasingly complex, especially for multinational companies that interact with multiple regulators in different jurisdictions. Companies should ensure that information on similar issues is provided in a consistent and consistent manner in different jurisdictions, in order to avoid additional risks and careful control by regulators. The legal service's response programme should meet the following requirements: quickly identify similar requests that have already been made in other regions and develop an appropriate legal strategy; monitor trends in the volume and types of requests, and appropriate responses from regulators; quickly mobilise specialised experts and get their approval from management; scale the response depending on the volume and urgency of requests in real time.

Therefore, the company's legal team should ensure effective interaction with regulatory authorities around the world. Advanced legal training programmes, well-established workflows, and databases will help companies to better respond to regulatory requests and reduce risks. To summarise the above recommendations, a list of measures that businesses should take to respond appropriately to changes in the geopolitical situation and related risks can be offered:

- Training specialists of risk management departments in ways to identify geopolitical risks, methods of their quantitative and qualitative analysis, and approaches to managing them.
- Development of internal policies and procedures for identification, quantitative and qualitative analysis of geopolitical risks, including the creation and configuration of a language model, selection of information sources, identification of risk markers for a specific industry, region, and enterprise.
- Development of internal regulations for responding to identified geopolitical risks, which define events-triggers of geopolitical risks, their quantitative indicators and corresponding scenarios of actions.
- Consideration of geopolitical risks in the budgeting process by calculating the budget in various geopolitical scenarios, analysing the sensitivity of the company's financial results to certain risks, and stress tests.

• Optimisation of the company's organisational structure to minimise the time spent passing information from specialists responsible for risk management to senior management for prompt adoption of informed management decisions.

• Strengthening the company's information security by improving the information and communication infrastructure and software architecture to counter leaks of confidential information and possible cyber-attacks from competing companies and states.

• Strengthening the legal component in the company's activities, including the involvement of specialists in the field of international law with an in-depth knowledge of the legislation of the countries in which the company operates and its key counterparties (especially tax, labour, environmental and intellectual property protection). Moreover, it is important to keep this knowledge up to date and respond promptly to changes in the legal and regulatory framework for all aspects of business.

• Diversify business risks by purchasing resources from different suppliers and countries, reviewing routes, modes of transport and carriers for their delivery, and cargo insurance.

• Searching for new alternative markets for finished products in different jurisdictions by adapting products and services to local standards and customer preferences.

• Ensuring transparency of the company's values and goals, their presentation to civil society and government agencies, legitimate lobbying of the company's business interests in the discussion and adoption of laws and bylaws.

CONCLUSIONS

In the current geopolitical realities, companies need to develop a strategy and build a geopolitical risk management infrastructure. This process will require the involvement of qualified specialists in risk management, information security and legal support, the development of identification methodology, quantitative and qualitative analysis of geopolitical risks, stress testing and preparation of corporate regulations for responding to identified risks, and changes in the management of many aspects of financial and economic activities of the enterprise. Establishing an effective geopolitical risk management system is a long, laborious, and expensive process, but absolutely necessary in the current economic and geopolitical conditions. Having such a system is no longer just a competitive advantage, but a time requirement for companies seeking to survive and develop in a changing world. In this paper, considering current trends, the definition of geopolitical risk was formulated and it was proposed to classify it according to the forms of manifestation. This definition was intended to improve the understanding of the essence of geopolitical risk, the causes of its occurrence, and possible consequences among the responsible persons of companies. The proposed classification of geopolitical risks will help to properly structure the work on managing them, distributing powers and responsibilities between organisational units and officials of the enterprise.

The results of the study of the degree of influence of the geopolitical index of Ukraine on the variation of its macroeconomic indicators are generally consistent with the results of similar studies in other countries and reflect the typical behaviour of economic entities in conditions of risk and uncertainty. It can be stated that an increase in the level of geopolitical risk suppresses business activity, causing a decrease in production, external borrowing and direct investment, accompanied by a devaluation of the national currency and an acceleration of inflation. The obtained dependencies can be used by enterprises in drawing up business scenarios, business plans, and budgets in conditions of geopolitical turbulence. Further research should be devoted to the development of methodological tools for predicting, identifying, and assessing geopolitical risks, and modelling their potential impact on individual industries and various aspects of companies' activities.

ACKNOWLEDGEMENTS

None.

CONFLICT OF INTEREST

None.

REFERENCES

[1] Allen, J. (2024). *Companies need robust legal strategy to manage geopolitical risk*. Retrieved from https://news.bloomberglaw.com/us-law-week/companies-need-robust-legal-strategy-to-manage-geopolitical-risk.

[2] Bosone, C., Dautović, E., Fidora, M., & Stamato, G. (2024). *How geopolitics is changing trade*. Retrieved from https://cepr.org/voxeu/columns/how-geopolitics-changing-trade.

[3] Bremmer, I., & Kupchan, C. (2024). *Top risks 2024. Eurasia Group's annual report*. Retrieved from https://www.eurasiagroup.net/issues/top-risks-2024.

[4] Caldara, D., & Iacoviello, M. (2022). Measuring geopolitical risk. *American Economic Review*, 112(4), 1194-1225.

[5] Caldara, D., Conlisk, S., Iacoviello, M., & Penn, M. (2024). *Do geopolitical risks raise or lower inflation?* Retrieved from https://www.matteoiacoviello.com/research_files/GPR_INFLATION_PAPER.pdf.

[6] De Villa, M.A. (2023). Assessing geopolitical risk: A multi-level approach for top managers of multinationals. *AIB Insights*, 23(1). doi: 10.46697/001c.67875.

[7] De Villa, M.A., Rajwani, T., & Lawton, T. (2015). Market entry modes in a multipolar world: Untangling the moderating effect of the political environment. *International Business Review*, 24(3), 419-429. doi: 10.1016/j.ibusrev.2014.10.001.

[8] Diedenhofen, B., & Musch, J. (2015). Cocor: A comprehensive solution for the statistical comparison of correlations. *PLoS ONE*, 10(4), article number e0121945. doi: 10.1371/journal.pone.0121945.

[9] Donilon, T., Kress, C., Aldrich, J., & Lee, S. (2024). *Geopolitical risk dashboard*. Retrieved from https://www.blackrock.com/corporate/literature/whitepaper/geopolitical-risk-dashboard-july-2024.pdf.
[10] Frank, R.W., & Martínez i Coma, F. (2023). Correlates of voter turnout. *Political Behavior*, 45(2), 607-633. doi: 10.1007/s11109-021-09720-y.
[11] Funke, M., Schularick, M., & Trebesch, C. (2023). Populist leaders and the economy. *American Economic Review*, 113(12), 3249-3288. doi: 10.1257/aer.20202045.
[12] Geopolitical uncertainty as risk to business. (2024). Retrieved from https://globescan.com/2024/04/18/insight-of-the-week-geopolitical-uncertainty-as-risk-to-business/.
[13] Gilbert, M., & Lang, N. (2024). *Geopolitical risk is rising. Here's how CEOs can prepare*. Retrieved from https://www.bcg.com/publications/2024/geopolitical-risk-rising-how-ceos-prepare.
[14] Giuliani, M., & Massari, S.A. (2019). The economic vote at the party level: Electoral behaviour during the Great Recession. *Party Politics*, 25(3), 461-473. doi: 10.1177/1354068817728214.
[15] Góes, S., & Bekkers, E. (2022). *The impact of geopolitical conflicts on trade, growth, and innovation*. Geneva: World Trade Organization.
[16] Herasymenko, O. (2021). *Risk-oriented management in the system of economic security of the enterprise*. (Doctoral dissertation, Cherkasy National University named after Bohdan Khmelnytskyi, Cherkasy, Ukraine).
[17] Holikov, A. (2006). *Economic and mathematical modeling of global economic processes*. Kharkiv: Kharkiv National University named after V.N. Karazin.
[18] International Monetary Fund. (2023). *Global financial stability report: Safeguarding financial stability amid high inflation and geopolitical risks*. Retrieved from https://www.astrid-online.it/static/upload/imf_/0000/imf_gfsr_04-23.pdf.
[19] Kaya, A. (2024). *How are geopolitical risks affecting the world economy?* Retrieved from https://www.economicsobservatory.com/how-are-geopolitical-risks-affecting-the-world-economy.
[20] Kaya, A.I., & Erden, L. (2023). Capital-flow volatility in emerging markets: A panel GARCH approach. *International Finance*, 26(2), 172-188. doi: 10.1111/infi.12427.
[21] Kriesi, H., & Hutter, S. (2019). Crises and the transformation of the national political space in Europe, In S. Hutter & H. Kriesi (Eds.), *European party politics in times of crisis* (pp. 3-32). Cambridge: Cambridge University Press. doi: 10.1017/9781108652780.001.
[22] Loke, H.-Y., & Hayes, G. (2023). *Navigating geopolitical risk. Building resilience demands collaboration in a challenging world*. London: Airmic & Chartered Institute of Internal Auditors.
[23] Lu, Z., Gozgor, G., Huang, M., & Lau, M.C.K. (2020). The impact of geopolitical risks on financial development: Evidence from emerging markets. *Journal of Competitiveness*, 12(1), 93-107. doi: 10.7441/joc.2020.01.06.
[24] Lupan, I., Avramenko, O., & Akbash, K. (2015). *Computer statistical packages: Teaching and methodological manual*. Kirovohrad: "KOD".
[25] Marx, B., Pons, V., & Rollet, V. (2022). *Electoral turnovers*. Cambridge: National Bureau of Economic Research. doi: 10.3386/w29766.
[26] Mignon, V., & Saadaoui, J. (2024). How do political tensions and geopolitical risks impact oil prices? *Energy Economics*, 129, article number 107219. doi: 10.1016/j.eneco.2023.107219.
[27] Official Website of National Bank of Ukraine. (n.d.). Retrieved from https://bank.gov.ua/.
[28] Pagliari, M.S., & Hannan, S.A. (2024). The volatility of capital flows in emerging markets: Measures and determinants. *Journal of International Money and Finance*, 145, article number 103095. doi: 10.1016/j.jimonfin.2024.103095.
[29] S&P Global. (2024). *Top geopolitical risks of 2024*. Retrieved from https://www.spglobal.com/en/research-insights/market-insights/geopolitical-risk.
[30] Skokova, L. (2021). *Risks in the modern unstable society: Social and cultural dimensions*. Kyiv: Institute of Sociology of the National Academy of Sciences of Ukraine.
[31] Stavytsky, A. (2018). Influence of modern geopolitical challenges on state's economic security. *Bulletin of Taras Shevchenko National University of Kyiv. Economics*, 4(199), 45-55. doi: 10.17721/1728-2667.2018/199-4/6.
[32] Tan, O.F., Cavlak, H., Cebeci, Y., & Güneş, N. (2022). The impact of geopolitical risk on corporate investment: Evidence from Turkish firms. *Indonesian Capital Market Review*, 14(1), article number 2. doi: 10.21002/icmr.v14i1.1138.
[33] Toptunova, L., Vasylieva, L., & Kliovanik, O. (2008). *Study of univariate and multivariate regression, analysis of time series in the Statistica 6 system*. Kramatorsk: Donbass State Engineering Academy.

Валентина Червякова

Кандидат економічних наук, доцент
Національний транспортний університет
01010, вул. М. Омеляновича-Павленка, 1, м. Київ, Україна
https://orcid.org/0000-0003-3568-3836

Тетяна Червякова

Кандидат технічних наук, доцент
Національний транспортний університет
01010, вул. М. Омеляновича-Павленка, 1, м. Київ, Україна
https://orcid.org/0000-0002-3672-9173

Організаційне забезпечення функціонування підприємств в умовах геополітичної турбулентності

Анотація. Загострення політичного протистояння та економічної конкуренції між провідними державами світу призвело до руйнування усталених міжнародних відносин, збройних конфліктів, запровадження санкцій, фінансової нестабільності, обмежень щодо торгівлі та співробітництва в технологічній сфері, що суттєво підвищує складність ведення як локального, так і міжнародного бізнесу. Оскільки геополітичний ризик є відносно новим і серйозним викликом для компаній, постає проблема дослідження його теоретичних аспектів та розробки організаційно-методичних підходів управління ним на рівні суб'єктів господарювання. Дана стаття присвячена дослідженню сутності геополітичного ризику, підходів до його класифікації, оцінювання та врахування у фінансово-господарській діяльності компаній. Сформульовано авторське визначення геополітичного ризику та запропоновано його класифікацію за формами прояву. Проведено критичний огляд методичних підходів до кількісного і якісного аналізу геополітичних ризиків. Аналіз взаємозв'язку рівнів індексу геополітичного ризику та деяких макроекономічних показників України показав, що варіація рівнів валового зовнішнього боргу залежить від індексу геополітичного ризику України на 88 %, індексу споживчих цін – на 86 %, прямих інвестицій з України – на 84 %, прямих інвестицій в Україну – на 76 %, внутрішнього валового продукту України – на 90 %, офіційного курсу гривні щодо долара США – на 98 %. Отримані залежності дозволяють прогнозувати поведінку економічних суб'єктів залежно від динаміки рівня геополітичного ризику та розробляти відповідні сценарії реагування. На основі рекомендацій фахівців у сфері управління ризиками щодо забезпечення функціонування підприємств в умовах геополітичної турбулентності запропоновано перелік заходів, яких мають вживати компанії, щоб передбачати і належним чином враховувати зміни геополітичної ситуації та ефективно протидіяти супутнім ризикам

Ключові слова: геополітичний ризик; невизначеність; багатополярність; кореляція; управління ризиками; диверсифікація