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The Importance of Risk Management and Marketing Innovation Activities of Firms During Health, Political, Energy, and Economic Crises

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Abstract
Declining business activity, decreasing income, and sanctions imposed by policymakers have increased firms' perception of business during health, political, energy, and economic crises. Since marketing innovation activities require less time to adopt and less costly investments, firms can apply these activities to mitigate the negative consequences of those tough economic times. Moreover, since marketing innovation is a dynamic capability included in the Resource-based View, it is a good strategy for businesses to react to unexpected and uncontrollable external business risk factors. In this regard, this research aims to analyse whether firms' application of marketing innovation activities differs depending on their perception of business risk during and after periods of COVID-19, the war between Russia and Ukraine, rising energy prices, and economic recessions. To achieve this goal, this research analyzes 1367 enterprises operating in various European countries and across multiple industries, including iron and mining. Moreover, the research data are collected through online questionnaire surveys, and the researchers apply Ordinal Logistic Regression Tests for analysis purposes. The results show that firms apply marketing innovation activities more when they perceive business risk less intensively during and after tough economic times. The sectors and countries in which firms operate, as well as the geographical scope of companies' activities, may explain the findings of this study.

Keywords
marketing innovation, financial risk management, finance, business risk, Resource-based View, Covid-19, war, energy crises, economic crises.

Introduction

Firms frequently face business risks, including financial risks that stem from pandemics, wars, and economic recessions in their external environments. In this regard, the issues between 2019 and 2025 have made firms perceive their business risk more intensively. This is because this period encompasses the COVID-19 pandemic, the war between Russia and Ukraine, and the rise in energy prices, all of which have contributed to tough economic times.

For instance, the COVID-19 pandemic began at the end of December 2019 in Wuhan, China (Caballero-Morales, 2021), and subsequently spread worldwide (Rishi et al., 2024). Due to the increasing number of cases and deaths from the coronavirus, the World Health Organization (WHO) announced on March 11, 2020, that the coronavirus had become a pandemic and warned countries to take the necessary actions against this issue (Ding & Li, 2021). In this regard, governments have applied various sanctions and quarantine measures to reduce the number of cases and deaths, as well as the spread of the virus, in order to protect people's lives. Those sanctions included border closures (Jabeen et al., 2023), social isolation, lockdowns, travel restrictions (Sharma et al., 2024), social distancing, sanitizing, mask-wearing (Rishi et al., 2024), and cashless transactions (Ngware, 2024). However, these sanctions had a negative impact on the economies, as they led to increases in unemployment rates and the closure of enterprises (Caballero-Morales, 2021; Nazli, 2024). Moreover, remaining firms encounter many financial troubles regarding shortages in their cash flows (Rishi et al., 2024), lack of liquidity (Jabeen et al., 2023), limited access to financial sources (Sharma et al., 2024), fragile structures, disruptions in supply chains (Hatab & Lagerkvist, 2024; Naisa et al., 2023); thus, many businesses face financial risk management issues. For instance, travel restrictions had a more significant impact on businesses in the tourism industry (Tung & My, 2023; Strouhal et al., 2024), including airlines, bus and train companies, hotels, and restaurants (Nazli, 2024). For these reasons, many businesses negatively perceive the consequences and the conditions of the pandemic that increased their business risk.

Concerning the war between Russia and Ukraine, Russia's attack started on February 24, 2022 in Ukraine (Oklander et al., 2024) and caused many issues for businesses and individuals, such as disruptions in supply chains (Hatab & Lagerkvist, 2024), decreases in operations and income of businesses (Nazli, 2024), worsened financial stability, increases in inflation, and transportation cost (Korneyev et al., 2022; Hatab & Lagerkvist, 2024). Except for businesses in Ukraine and Russia, many European countries have also faced similar troubles. The war between Russia and Ukraine has also reduced firms' ability to recover from the COVID-19 period and increased obstacles to survive. Many Ukrainian firms, transportation infrastructure, ports, storages, and some facilities have also been damaged and destroyed because of the attacks by Russia (Abu Hatab, 2022). For these reasons, many firms perceived greater business risk, especially at the beginning of the war. Thus, some businesses from various industries were unable to withstand these conditions and subsequently went bankrupt (Korneyev et al., 2022). This fact also led many people to lose their jobs (Ilchuk et al., 2023).

On the other hand, although the availability of energy is a fundamental driver of economic productivity, as it directly influences industrial expansion and firm profitability (Xu et al., 2022), the energy crisis led by the Russia-Ukraine war, have caused disruptions in global energy trade, increasing fuel costs (Martínez-García et al., 2023). The linkage between energy sources has also led to increases in electricity costs (Ghallabi et al., 2025), as gas is used to generate electricity in power plants (Martínez-García et al., 2023). The current energy crisis has also led to increased energy prices, particularly in Europe (Martínez-García et al., 2023; Hatab & Lagerkvist, 2024). This is because the sanctions applied by EU countries on Russia have led this country to limit its oil and gas exports to EU nations (Martínez-García et al., 2023), and this energy shortage has created many problems for businesses from different industries, and the economic growth of those countries (Xu et al., 2022; Ghallabi et al., 2025) that are heavily dependent on Russian oil and gas (Ferriani & Gazzani, 2023). Another reason for the higher energy prices in Europe is the limited fossil energy production in EU countries (Ferriani & Gazzani, 2023). This crisis has also heightened the financial risks faced by businesses in various sectors (Ghallabi et al., 2025), which are heavily dependent on oil and gas, including agriculture (Hatab & Lagerkvist, 2024), accommodation, food services, education, and health (Martínez-García et al., 2023). For these reasons, many firms more intensively perceived business risk during the energy crisis period as well.

Economic crises, challenging financial conditions, and downturns, such as those following the COVID-19 pandemic, wartime, and periods of increased energy crises, have significantly hindered the economic growth of nations. The inflation rates of various countries have risen after these periods, leading to a decline in individuals' purchasing power. Moreover, economic crises lead to an increase in the number of people living in poverty in a country (Żuk, P. & Żuk, 2024). Consequently, declines in business revenues and sales have caused firms to experience these tough economic conditions more intensely (Huang et al., 2022) and to have lower organizational performance (Brenčič et al., 2012). Additionally, firms have struggled with limited access to finance, faced increased operational costs, and repayment problems that exacerbate their financial risk during and after tough economic times (Kraemer-Eis et al., 2024). Many firms encountered similar challenges during the great recession

of 2007-2009 as well (Rishi et al., 2024). Thus, financial risk based on financial difficulties has been the most significant business risk that businesses have perceived negatively during those tough economic times.

To sum up, health crises (such as the COVID-19 pandemic), political conflicts (including wars), and economic issues (like energy crises and economic recessions) harm economies and threaten the survival of businesses worldwide. Firms perceive these uncontrollable risk factors more intensely, since these factors are unavoidable for firms (Rodriguez et al., 2010). This is because the COVID-19 pandemic, the war between Ukraine and Russia, energy crises, and economic recessions originate from the external environment of firms (Wang et al., 2020; Espinoza-Benavide & Guerrero, 2025), which cannot be controlled by businesses and significantly affect their risk perception (Kraus et al., 2015). As firms increasingly perceive financial difficulties that threaten their survival during challenging economic times, financial risk has become one of the primary sources of business risk (Feng et al., 2023). Some researchers emphasize that financial risk is one of the most significant business risks affecting the financial performance of companies during crises (Ingram et al., 2023).

On the other hand, those unexpected and unavoidable situations that cause financial troubles for businesses require firms to implement proper business risk management approaches. This is because firms can respond to these issues by applying dynamic risk management processes (Kuděj et al., 2023), which enable businesses to identify, analyze, assess, and manage risks, including financial risk. Although these unforeseen economic circumstances stem from firms' external environment, firms' perceptions and responses differ depending on their own internal resources and capabilities. These internal resources and capabilities that enable businesses to survive and manage business risk in tough economic times are explained by dynamic capabilities included in the Resource Based View (Bogodistov & Wohlgemuth, 2017; Krajcik et al., 2023; Civelek et al., 2023a; Civelek et al., 2024). Dynamic capabilities are a crucial ability of businesses to react to unexpected and uncontrollable external business risk factors and reduce uncertainties. Those dynamic capabilities also enable businesses to manage financial risk (Lee & Wang, 2023), thereby allowing them to perceive business risk less intensively.

However, the vulnerable structure and lack of resilience of small businesses reduce their ability to manage business risk during economic recessions, and they can more intensively perceive business risk. The reason for the vulnerable structure and lack of resilience of small businesses, especially small and medium-sized enterprises (SMEs), is mainly based on their lack of financial resources. Although SMEs and other businesses may lack business risk management capabilities, including financial risk management, and perceive business risk more intensely under tough economic conditions, marketing innovation (MARI) can serve as an effective solution to mitigate business risk during economic recessions. In this regard, this research aims to investigate how firms' perceptions of business risk affect their propensity to apply MARI activities. In parallel to this purpose, some research questions might arise as follows: "What is the impact of business risk perception on MARI activities of enterprises?", "What are the drivers of MARI activities during times of pandemic, political, and economic crises?", and "How do the firms' perceptions regarding the Covid-19 pandemic, the war between Russia and Ukraine, the energy and the economic crises affect their MARI?".

Even if firms perceive business risk intensively, they may still be prone to applying MARI activities. This is because MARI activities require less time to adopt and less costly investments compared to other innovations in machinery, technology, and infrastructure (Wang et al., 2020). Moreover, MARI enables businesses to find quick innovation solutions that suggest low-risk and low-cost changes in products and services (Naidoo, 2010). Thus, MARI has proven to be a viable strategy for SMEs to counteract declining sales and sustain operations in times of crisis (Wang et al., 2020; Rishi et al., 2024; Naidoo, 2010). Some scholars also highlight the importance of MARI for businesses to survive in crisis periods such as Covid-19 (D'Attoma & Ieva, 2020; Rishi et al., 2024; Ding & Li, 2021), the war (Korneyev et al., 2022; Ilchuk et al., 2023), and economic recessions (Yao & Li, 2023). For instance, during the COVID-19 pandemic, many firms swiftly transitioned some of their marketing operations to online platforms by utilizing advanced technologies (Rishi et al., 2024; Sharma et al., 2024), as governments' sanctions prompted many people to stay and work from home (Ding & Li, 2020). Similarly, during the war period, many Ukrainian businesses have utilized social media platforms such as Facebook, WhatsApp, and Instagram, as well as e-commerce platforms, to communicate with their customers and facilitate online sales. Consequently, there has been a rapid development in the Ukrainian e-commerce market (Ilchuk et al., 2023).

MARI requires new initiatives to make important changes in product promotion, design, packaging, placement, and pricing (OECD, 2005; Huang et al., 2022; Rishi et al., 2024). For instance, a component of MARI promotion includes the use of new media or technologies to create advertisements and introduce a loyalty program. On the other hand, while placement deals with selling products via the internet, mobile, and direct sales channels, and developing e-commerce and its technologies, pricing is related to the implementation of new pricing strategies, such as dynamic pricing, to market products and services in line with consumers' demand. Firms can also produce new products and services by applying MARI activities that provide sustainable competitive advantages for them (D'Attoma & Ieva, 2020). Moreover, some marketing-related activities, such as customer loyalty programs, influencer marketing, internet retailing, and the application of the marketing mix (Varadarajan et al., 2022), as well as market research, segmentation, and marketing information systems, represent other MARI activities (Medrano & Olarte-Pascual, 2016). MARI increases the profitability and innovation performance of companies

(D'Attoma & Ieva, 2020) since firms can find more customers (Ding & Li, 2020) due to giving quick responses to frequently changing customers' demand and needs (Naisa et al., 2023).

MARI has also been identified as an internal capability included in the Resource-based View by various researchers (Adams et al., 2019; Naidoo, 2010). MARI is also a dynamic capability, as firms possessing this ability can continuously perform innovative actions in turbulent and changing economic conditions (Wziątek-Kubiak & Pęczkowski, 2021). According to Barney (1991), firms' resources and capabilities that are valuable, rare, difficult to imitate, and non-substitutable provide sustainable competitive advantages for them. These resources and capabilities enable businesses to make product and service innovation (Civelek et al., 2023b), increase productivity, and apply strategic marketing strategies such as marketing mix (Adams et al., 2019; Lincényi & Bulanda, 2023) that affect their product, price, place, and promotion activities (Abou-Shouk et al., 2024) and customer satisfaction (Sobre Frimpong et al., 2024).

While some studies only focus on business risk in health crises such as COVID-19 (Cucculelli & Peruzzi, 2020; Liu & Nazareno, 2024), political crises such as the war between Russia and Ukraine (Abu Hatab, 2022; Hatab & Lagerkvist, 2024; Nazli, 2024), energy crises (Ferriani & Gazzani, 2023; Martínez-García et al., 2023), and economic crises (McNulty et al., 2013; Ozili, 2021), they do not investigate the relationships between business risk based those crises and MARI performance of businesses.

Even though some studies analyze the impact of relationship between business risk and innovation and suggest innovation activities and marketing innovation as a proactive tool to reduce business risk during crises period including COVID-19: Caballero-Morales, S. O. (2021) Chesbrough, H. (2020), Ding, A. W., & Li, S. (2021), Greco et al., 2022 Jabeen, et al. (2023) Naisa et al. 2023, the war (Korneyev, et al., 2022; Oklander et al., 2024)., energy crises Cohen et al., 2017; Ley et al., (2016), Xu et al., 2022, Economic crises (Makovec Brenčič et al., 2012) Naidoo, V. (2010), Yao, L., & Li, J. (2023). None of them brings all these issues together into a unique paper. Thus, this paper focuses on health, politics, energy, and economic crises, while others only focus on energy, politics, and health issues separately. Moreover, none of the studies mentioned above focuses on Czech, Slovakian, Polish, and Hungarian firms when investigating business risk and MARI activities. Since those countries have open economies, they can be influenced by economic shocks and recessions; therefore, investigation of firms from those countries might be noteworthy. Even though the economic transformations and the changes in of economic systems of those countries have already analyzed by some researchers (Havel et al., 2022; Csach & Havel, 2024), those researchers neither bring various countries into a unique paper nor look at health, political, energy and economic crises together in a paper.

Concerning theoretical contributions, this paper integrates two important dynamic capabilities explained by RBV, namely risk management capabilities and marketing innovation, into a single research study. While the former represents a firm's ability to react to external, uncontrollable factors, the latter provides opportunities to minimize these uncontrollable risk factors by utilizing internal factors, such as marketing innovation. The detailed explanation and integration of these dynamic capabilities also enable researchers to gain benefits from the arguments presented in this research.

This paper also expands the scope of the dynamic capability perspective of RBV, as it brings various business risk management capabilities, such as financial risk management and innovation capabilities, together into a unified framework. This paper also emphasizes the importance of MARI activities during the crisis period. Thus, firms can benefit from the results of this paper, as MARI activities can be a crucial tool for them to manage crises and mitigate the more intensive perception and impact of business risk. Since this paper puts great emphasis on dynamic capabilities, executives of businesses can also notice their weaknesses regarding their risk management and marketing innovation abilities and try to improve themselves to deal with the consequences of health, political, and economic crises. Furthermore, this study suggests various

scenarios that can be used as policy implications for governments to stimulate MARI and business risk management practices.

The rest of the paper will be structured in the following sequence. The next section, Literature Review, presents empirical arguments from previous studies to develop research hypotheses. The researchers explain methodological approaches and data collection methods in the Methodology section. While the Results section presents research results and details regarding hypothesis testing, scholars compare their findings with those of other studies and provide policy implications in the Discussion section. Finally, the authors of this research highlight the most crucial points and limitations of the study in the Conclusion section, together with the recommendations for further studies.

Materials and Methods

Materials

Business risk in the COVID-19 Period and MARI

Due to the COVID-19 pandemic, many countries applied various sanctions such as travel constraints, physical distancing, and lockdowns that created big troubles for business operations (Iwu et al., 2023; Rishi et al., 2024). This is because these restrictions changed customers' purchasing behaviors, preferences and demand (Wang et al., 2020) and many individuals did not want to buy unnecessary goods causing decreases in firms' revenues (Naisa et al., 2023). Moreover, the restrictions caused supply chain disruptions and logistical problems, which put pressure on raw material prices and product costs (Ozili, 2021; Naisa et al., 2023). All these issues increased the business risk of enterprises and their concern regarding their survival. On the other hand, the restrictions applied by the governments made people stay at their homes and spend more time via online channels (Rishi et al., 2024). Due to their agile and flexible structure, which enables them to take quick actions against external issues (Jabeen et al., 2023; Naisa et al., 2023), many firms have moved their traditional business activities to online channels (Wang et al., 2020).

Although the majority of firms had a negative perception of the COVID-19 conditions, they performed various MARI activities by making price reductions (Naisa et al., 2023), diversifying their goods and services, increasing online sales, and improving the quality of their products and services (Nazli, 2024). Moreover, many firms took various actions regarding product innovation (Caballero-Morales, 2021; Ding & Li, 2021), packaging, design, promotion, pricing of their goods and services Rishi et al., 2024) to survive and create competitive advantages against their rivals (Greco et al., 2022; Wang et al., 2020). Therefore, MARI activities of firms skyrocketed in Covid-19 period (Wang et al., 2020). Furthermore, MARI strategies have improved the efficiency of marketing activities and reduced costs for firms, as businesses could directly execute these activities without relying on intermediary firms, expand their sales channels, and maintain closer communication with their customers (Huang et al., 2022). In this regard, the majority of businesses around the world moved their marketing activities to digital channels such as online marketing, email marketing (Naisa et al., 2023), e-commerce (Wang et al., 2020), social media (Huang et al., 2022) or other communication platforms (WhatsApp, ZOOM, Skype) by applying and adopting the usage of various internet and digital technologies (Caballero-Morales, 2021). For these reasons, MARI has been a crucial ability for firms to manage business risk under pandemic conditions, as it does not require complicated R&D activities and facilitates easier adaptation to changing customer preferences (Ozili, 2021; Naisa et al., 2023). These arguments lead this paper to suggest the following hypothesis:

H1: A positive relationship exists between more intensive perception of business risk by firms in the Covid-19 period, and firms' MARI activities.

Business risk in the Russia-Ukraine War Period and MARI

Unlike the COVID-19 pandemic, which caused issues in supply chains and increased unemployment rates, the war between Russia and Ukraine has led to restrictions in international trade activities, including export barriers and disruptions in trade routes. Besides these negative outcomes, the war has also increased inflation and energy prices that have already been affected by the COVID-19 pandemic (Ilchuk et al., 2023). By examining SMEs from Egypt, Hatab and Lagerkvist (2024) state the negative perception of enterprises regarding the Russian-Ukrainian war and its impact on business performance. Business risk perceived by these enterprises also increases their concern regarding their survival (Lu et al., 2020). By analyzing firms from Türkiye, Nazli (2024) confirms the negative perception of businesses regarding the war between Russia and Ukraine, as the war has caused decreases in firms' revenues and their business activities. Thus, many firms perceive these restrictions as a significant business risk as their intensity increases (Hatab & Lagerkvist, 2024).

Although the war between Russia and Ukraine have created many difficult situations for individuals and businesses such as reduction in purchasing power, disruptions in supply chain, increases in energy prices and inflation and changes in customer demands and preferences (Korneyev et al., 2022), the war has caused increases in internet penetration, smartphone usage, online sellers' reliability and trust to digital payments (Ilchuk et al., 2023). Thus, there has been an increase in e-commerce, social media marketing, internet marketing (Oklander et al., 2024), digital marketing (Zlatova, 2022), online marketing, and other MARI activities of businesses (Nazli, 2024). In this regard, firms have utilized these platforms to mitigate concerns regarding business risk, as MARI activities enable businesses to respond quickly to the negative consequences of the war. For instance, the costs of using ads via popular channels such as YouTube and Facebook and the installation of apps have decreased. Therefore, businesses created accounts on various social media platforms, including Facebook, Instagram, YouTube, TikTok, and Pinterest, to reach a greater number of people through these platforms. Companies without websites and social media accounts conducted their online sales through digital marketplaces such as Shopify and Kraft, and applied search engine optimization solutions to reach more customers (Oklander et al., 2024). Many firms have also increased their spending on digital advertising by applying search engine optimization, pay-per-

click advertising, influencer marketing, internet advertising, and email marketing to draw their customers' attention (Korneyev et al., 2022).

Although firms negatively perceive the risk that the war has caused, firms' MARI activities, such as product innovation, promotion of the products via social media platforms and websites, have made them competitive under the war conditions (Nazli, 2024). Moreover, many firms started developing products for military purposes, and after that, they looked for new markets to sell their products (Oklander et al., 2024). Thus, firms initially diversified their products and then attempted to enter new markets with their existing products. Similar to Oklander et al. (2024), Zlatova (2022) also emphasizes the importance of using digital marketing tools to mitigate the negative outcomes of war. Firms that apply effective internet marketing strategies and use internet marketing tools can survive in war conditions. Due to having these arguments, a hypothesis might be presented as follows:

H2: A positive relationship exists between more intensive perception of business risk by firms in the war period, and firms' MIN activities.

Business risk in the increases in energy prices and MARI

Due to high dependency on oil and gas imports from Russia (Ferriani & Gazzani, 2023), many European countries, including Czechia, Slovakia, Poland, and Hungary, have experienced the negative impact of the energy crisis led by the war in Ukraine (Martínez-García et al., 2023; Ghallabi et al., 2025). Because of European countries' sanctions on Russia, Russia has also applied some counterattack strategies, such as asking for ruble payment for gas export, reducing energy supplies, and implementing price caps. These facts have increased the tension between EU states and Russia. Thus, there has been a rapid increase in energy prices in these countries, including electricity that is produced by using gas (Ferriani & Gazzani, 2023). Similar to gas, crude oil is also crucial for energy generation (Ghallabi et al., 2025). The increases in the price of these energy sources and vulnerable energy supplies have made businesses face greater energy costs (Ferriani & Gazzani, 2023), which have caused inflation. High inflation has also increased commodity prices (Cohen et al., 2017; Ghallabi et al., 2025), and this fact has not only decreased customers' demand for products but also firms' revenues. For these reasons, firms have more intensively encountered the increases in energy prices (Martínez-García et al., 2023). Except for the studies that analyzed European firms, Xu et al. (2022) also confirm the similar issues that energy prices caused for firms in Pakistan. According to the researchers, increases in energy prices decrease the profitability and productivity of businesses.

Although firms perceive the increases in energy prices negatively and feel a greater business risk under these conditions, they have implemented various MARI activities to mitigate the negative consequences of energy prices and reduce their business risk. For instance, Cohen et al. (2017) investigate firms from the UK and highlight the importance of price reductions and product innovation in surviving under conditions of increasing energy prices. Moreover, Ley et al. (2016) find that increases in energy prices have increased green and technological innovations. Similar to Ley et al. (2016), other studies have also demonstrated a positive association between increases in energy prices and innovative investments (Van Leeuwen & Mohnen, 2017) as well as innovative activities (Aghion et al., 2016), including marketing (Verdolini & Galeotti, 2011). Ghallabi et al. (2025) also emphasize the importance of innovation for businesses to secure themselves against the negative impact of the energy crisis. Although firms might perceive increases in energy prices negatively, they take innovative actions to reduce the negative impact of the energy prices. In this regard, when firms more intensively perceive the increases in energy prices, they might be prone to take more innovative actions regarding marketing. These arguments lead to setting another hypothesis as follows:

H3: A positive association exists between more intensive perception of business risk by firms during the increases in energy prices, and firms' MARI activities.

Business risk in economic recessions and MARI

Firms have also faced numerous difficulties in managing their financial risk during and after the COVID-19 pandemic and the Russian-Ukrainian war (Boers et al., 2025). This is because these issues can cause economic recessions and crises that increase firms' bankruptcy risk, and firms more intensively perceive financial issues, which reduce their probability of survival (Moiseev et al., 2023). For instance, since customers want to save money and have more conservative purchasing patterns during and after tough economic times, firms' income can be lowered. Moreover, economic crises can cause inflation that increases the cost of raw materials, and products that can reduce firms' sales and revenues (Wang et al. 2020). In this regard, firms that encounter intensive financial difficulties during a crisis period can apply marketing activities to reduce their financial concerns, as MARI activities can increase their revenues (Ding & Li, 2021).

This is because an economic shock in an economy motivates firms to perform product innovation and apply innovative models in e-commerce operations (Moiseev et al., 2023). Firms making innovative investments have also controlled their operations and survived in crisis periods (Cucculelli & Peruzzi, 2020) since innovation enables firms to reduce bankruptcy issues (Kaya, 2022), to increase their credit access (Civelek et al., 2023b), and to become resilient against financial risk (Civelek et al., 2022). Naidoo (2010) also emphasizes the importance of

MARI capabilities for businesses to thrive in challenging economic times (Naidoo, 2010). As part of MARI activities, advertising and product differentiation strategies have also increased firms' survival regarding bankruptcy issues due to increasing sales of firms and their financial performance (Jindal, 2020). The flexible structure of enterprises also enables them to diversify their product, make detailed market research during and after the crisis period (Kahveci et al., 2025). Firms that produce new products and services and apply innovative technologies have greater abilities to overcome financial risk problems (Agboola et al., 2023) due to increasing their sales and financial power, even during crisis periods (Civelek et al., 2023b). Firms that create new products requiring the use of new technologies can also make more accurate financial projections, representing effective financial risk management capabilities (Avagyan et al., 2022). For these reasons, firms that have the ability to manage their financial risk during and after the crisis period can increase their competitiveness and financial performance (McNulty et al., 2013).

Yao and Li (2023) analyze Chinese firms and emphasize that innovative activities also increase firms' growth during crises, and innovative strategies enable businesses to deal with the 2008-2009 economic recession. Medrano and Olarte-Pascual (2016) analyzed Spanish firms during and after the 2008 crisis and expected that firms applied MARI activities in both periods, with a higher implementation of MARI activities in 2008. Wziątek-Kubiak and Pęczkowski (2021) analyzed the innovation performance of Polish firms during the 2007 and 2009 crises and found that firms did not stop their innovation activities, such as developing new products, during the crisis period. The authors also declare that innovative marketing strategies minimize the negative effects of crises, especially for firms having better financial risk management capabilities. The results of those studies make this paper set the last hypothesis as follows:

H4: A positive association exists between more intensive perception of business risk by firms during economic crisis and firms' MIN activities.

Methods

The aim of this paper is to analyze the impacts of business risk perception on the MARI activities of enterprises. The researchers examine 1367 enterprises operating in Czechia, Slovakia, and Poland in line with this aim. The researchers have created an internet-mediated questionnaire and have sent it to prospective survey participants via Facebook. This online survey has been generated in English and then translated into Czech, Slovakian, Hungarian, and Polish. After that, the collected surveys were translated into English again by the experts. The researchers started to collect research data in January 2023 and finished it in June 2023.

Moreover, the researchers have used a purposive sampling method based on the survey participants' job status. The reason for using this sampling method is that the researchers aimed to gather the perceptions of firms' executives, including managers, owners, and shareholders. Since those people are usually well-informed about firms' financial and business risks, their perceptions regarding the issues faced by firms during and after the COVID-19 period, the Russia-Ukraine war, and increases in energy prices and financial issues are crucial to achieving the goal of this paper.

While 568 survey respondents are executives of Czech firms, the numbers of survey respondents from Slovakia, Hungary, and Poland are 376, 92, and 331, respectively. While the majority of the survey respondents' work experience is up to ten years, most of them are less than 46 years old. Moreover, most survey participants hold a bachelor's degree. All details regarding survey participants are presented in Table 1.

On the other hand, some characteristics of the analyzed enterprises are also depicted in Table 1. For instance, more than 70% of the analyzed firms are small and medium-sized enterprises (SMEs). Most of the analyzed firms have been doing business for more than ten years (61.44% of the whole sample).

Tab. 1. Sample profile

n: sample size		*n*	*Share*
Firm size	Micro	527	38.55%
	Small & Medium	460	33.65%
	Large	380	27.80%
	Total	1367	100%
Firm age	up to 5 years	386	28.24%
	5 to 10 years	141	10.32%
	more than 10	840	61.44%
	Total	1367	100%
Respondents' Educational Status	< bachelors'	660	48.28%
	bachelors'	193	14.12%
	>bachelors'	514	37.60%
	Total	1367	100%
Respondents' Age	Max. 36	532	38.92%
	36 to 45	316	23.12%

	More than 45	519	37.96%
	Total	1367	100%
Respondents' years of experience	Up to 5 years	528	38.63%
	5 to 10 years	185	13.53%
	More than 10	654	47.84%
	Total	1367	100%

Source: created by the authors.

The researchers analyzed five different survey questions presented in Table 2. The researchers measure MARI by using a survey question adopted from Ferraris et al. (2019). Some of other survey questions presented in Table 2, have also been used by other researchers when measuring business risk during economic crises (Nabi & Liñán, 2013).

Tab. 2. Research variables and survey questions.

Variables	Survey Questions
BUR1	"The intensity of business risks has not increased significantly after Covid-19."
BUR2	"The intensity of business risks has not increased significantly after the war between Ukraine and Russia".
BUR3	"The intensity of business risks has not increased significantly after the increases in energy prices".
BUR4	"Starting a business (or a new business) in the current economic climate would not pose serious financial difficulties for me".
MARI	"For three years, compared to the average competitor in the same industry, the firm has successfully achieved a rise in MARIs".

Source: own research.

The researchers scale the responses for the selected survey questions by applying a Three-point Likert Scale as "1 = disagree, 2 = neutral, 3 = agree". Hence, the dependent variable, namely, MARI, and the independent variables of this research, namely, BUR1, BUR2, BUR3, and BUR4, are measured using the Three-point Likert Scale that is transformed from a 7-point Likert Scale. While the higher value "agree" represents less intensive perceptions of the survey participants regarding business and financial risks, the greatest volume "agree" indicates better MARI of enterprises compared to their rivals, and vice versa.

Furthermore, this paper uses Ordinal Logistic Regression Tests for analysis purposes via the logit function of the SPSS statistical program because of the existence of ordinal and ranked dependent and independent variables. All these variables in the research models might be presented as follows:

"$logit(P(Y = 1 \mid X)) = \beta_0 + \beta_1 X_1$" (1)

"X– Independent variable (X_1: BUR1 for the 1st model, X_1: BUR2 for the 2nd model, X_1: BUR3 for the 3rd model, X_1: BUR4 for the 4th model)"

"Y = Ordinal dependent variable" (MARI)

"P – Probability of Y to be 1 ($Y = 1$)"

"$p/(1-p)$ – odds ratio"

"$ln[p/(1-p)]$ – log odds ratio, or logit"

"β_1 – Regression coefficients"

"β_0 – Constant term"

Some researchers, such as Divisekera and Nguyen (2018) and Dwivedi and Pawsey (2023), employ Ordinal Logistic Regression analyses when measuring MARI. This research also conducts analyses to verify the assumptions of the Ordinal Logistic Regression Test. The researchers select a 5% level of significance for the assumption and hypothesis testing.

Since all research models only include an independent variable, this research does not perform analyses to address the Multicollinearity assumption, which deals with the issue of multicollinearity between independent variables. Therefore, this paper analyzes the assumptions of Model Fitting, Goodness of Fit, and Independence of Errors. In this regard, Table 3 depicts the results of the assumption testing.

Tab. 3. Assumptions testing

Assumptions	Model Fitting				Goodness of Fit Pseudo R-square		Independence of Errors
Models	-2 Log likelihood	Chi-Square	df	p-values	Cox & Snell	Nagelkerke	Durbin-Watson test statistics
Model 1	87.694	21.145	2	0.000	0.015	0.016	1.905
Model 2	81.494	16.195	2	0.000	0.012	0.013	1.901
Model 3	65.720	7.716	2	0.021	0.006	0.006	1.910
Model 4	80.059	7.228	2	0.032	0.004	0.004	1.919

Source: created by the authors.

P-values indicated under the Model Fitting column of Table 3 are lower than a 5% level of significance for all research models (p-values for 1st, 2nd, 3rd, and 4th research models are 0.000, 0.000, 0.021, and 0.032, respectively). These values confirm that the inclusion of the predictors (independent variables) in the research models increases the predictive ability of the models for the dependent variable and indicates a better model fit. Therefore, it can be stated that BUR1, BUR2, BUR3, and FINR are good predictors to explain the changes in the dependent variable. For this reason, this paper does not violate the Model Fitting assumption.

The researchers also show the values of Cox & Snell and Nagelkerke indicators to represent the results of the Goodness of Fit assumption. The values presented in the columns of Cox & Snell and Nagelkerke indicate the percentage of changes that BUR1, BUR2, BUR3, and BUR4 make in MARI. For instance, when BUR1, BUR2, BUR3, and BUR4 are separately added to the first, second, third, and fourth research models, they explain 1.6%, 1.3%, 0.6%, and 0.4% of the changes in MARI, respectively. These values are illustrated under the Nagelkerke indicator in Table 3. Since the addition of these variables causes significant changes in MARI, the assumption of Goodness of Fit is not violated.

The last assumption that this paper will mention is the Independence of Errors. According to this assumption, while the autocorrelation issue should not occur between the residual terms, the cases and the research data should not have a relationship (Harrell, 2015). This assumption is measured by the Durbin-Watson Test statistics, and the results from this test are presented in Table 3, as well. The values from the Durbin-Watson Test should be close to 2 to avoid violating this assumption. Since the values presented under the column of the Durbin-Watson test differ between 1.901 and 1.919, they are close to 2. For this reason, this paper does not invalidate the Independence of Errors assumption. To sum up, this paper does not violate any assumptions of the Ordinal Logistic Regression Test. This fact makes this paper employ the Ordinal Logistic Regression Test for analysis purposes.

Results

As already mentioned in the previous section, this paper measures the dependent and independent variables of the research models by a Three-point Likert scale. For this reason, all variables analyzed in this paper have two cutoffs, and they are presented in Table 4. While level 1 represents the cutoff value of the survey respondents' replies for "disagree" to "neither disagree nor agree", level 2 indicates the cutoff value among the responses of "neither disagree nor disagree" to "agree".

Tab. 4 also presents the results for the impact of BUR1 on MARI. Concerning the p-values depicted in this table, the cutoffs of BUR1 are significant at the 5% level of significance due to being lower than 0.05 (BUR1 = 1:0.000, BUR1 = 2:0.0000). Hence, BUR1 is a significant predictor of MARI and has a significant impact on MARI. Moreover, it is important to consider the values presented under the "Estimate" column for the 1st and the 2nd cutoffs of BUR1 to determine whether this impact is positive or negative. Since these values are 0.600 and 0.636, respectively, they are positive. This fact confirms that a one-unit increase in BUR1 increases the log-odds of falling to a greater level of MARI by 0.636. In other words, a less intensive perception of business risk during the COVID-19 period by firms increases their performance in MARI activities. Therefore, if a firm less intensively perceives business risk during the COVID-19 period, it becomes more likely to take innovative marketing actions. For this reason, this paper confirms the negative impact of the more intensive perception of business risk by firms during the COVID-19 period on their MARI activities and fails to support H1.

Tab. 4. The results for MARI and BUR1

Variable	Estimate	S.E.	Wald	df	p-values	95% CI [Lower	Upper]
MODEL-1							
MARI = 1	0.655	0.124	27.806	1	0.000	[0.412	0.899]
MARI = 2	1.496	0.129	133.972	1	0.000	[1.243	1.750]
BUR1 = 1	0.600	0.135	19.677	1	0.000	[0.335	0.866]
BUR1 = 2	0.636	0.171	13.855	1	0.000	[0.301	0.971]

Source**:** created by the authors. Note: S.E.: Standard Error. df: Degree of freedom. CI: Confidence intervals

Corresponding to the results for the impact of BUR2 on MARI, Table 5 is illustrated below. P-values for the cutoffs of the BUR2 variable confirm the significant impact of this variable on MARI. This is because they are both lower than 5% significance level (BUR2 = 1:0.000, BUR2 = 2:0.007). The coefficient values that are presented under the "Estimate" column in Table 5 are positive for the cutoffs of BUR2 and are 0.538 and 0.467, respectively. Thus, a one-unit increase in BUR2 (from cutoff 1 to cutoff 2) increases the odds of MINNI occurrence by 0.467 times, with a 95% confidence interval between 0.126 and 0.809. In other words, enterprises that perceive business risks related to the Russian invasion of Ukraine less intensively are more likely to have better outcomes from MARI activities compared to enterprises with a more intensive perception of business risk. Thus, this paper proves the negative impact of the more intensive perception of business risk by firms during the war period on their MARI activities and does not support the H2 hypothesis.

Tab. 5. The results for MARI and BUR2

Variable	Estimate	S.E.	Wald	df	p-value	95% CI [Lower	Upper]
MODEL-1							
MARI = 1	0.583	0.126	21.340	1	0.000	[0.335	0.830]
MARI = 2	1.423	0.131	118.367	1	0.000	[1.166	1.679]
BUR2 = 1	0.538	0.137	15.465	1	0.000	[0.270	0.807]
BUR2 = 2	0.467	0.174	7.182	1	0.007	[0.126	0.809]

Source: created by the authors.

The results showing the impact of BUR3 on MARI are depicted in Tab. 6. According to Tab. 6, p-values are significant for the cutoff values of BUR3 (BUR3 = 1:0.005, BUR3 = 2:0.0044). Hence, BUR3 significantly affects MARI, and this effect is positive since the values under the "Estimate" column for "BUR3 = 1" is 0.413 and for "BUR3 = 2" is 0.364. This fact indicates that a one-unit decrease in BUR3, which represents a more intensive perception of business risk related to energy prices, decreases the log-odds of falling to a higher level of MARI by 0.413. Therefore, firms exhibit greater MARI activities when they have a less intensive perception of business risk related to energy prices. In this regard, this paper fails to support the H3 hypothesis, which assumes a positive relationship between firms' more intensive perception of business risk during energy crises and their MARI activities.

Tab. 6. The results for BUR3 and MARI

Variable	Estimate	S.E.	Wald	df	Sig.	95% CI [Lower	Upper]
MODEL-1							
MARI = 1	0.502	0.140	12.896	1	0.000	[0.228	0.776]
MARI = 2	1.337	0.144	86.576	1	0.000	[1.055	1.618]
BUR3 = 1	0.413	0.148	7.768	1	0.005	[0.123	0.704]
BUR3 = 2	0.364	0.204	3.192	1	0.044	[0.085	0.762]

Source: created by the authors.

Moreover, this research illustrates the results for the effect of BUR4 on MARI in Table 7. Since the p-values for the cutoffs of FINR are significant at the 5% level of significance (FINR = 1:0.000, FINR = 2:0.027), BUR4 has a significant impact on MARI. The values written under the "Estimate" column for the cutoffs of BUR4 are positive, 1.506 and 0.336, respectively. These values represent the positive impact of the less intensive perception of BUR4 on MARI. A one-unit rise on BUR4, 0.336 times, increases the odds of occurrence of MARI with a 95% confidence interval between 0.039 and 0.633. When firms perceive BUR4 less intensively, they are more likely to indicate higher MARI performance compared to firms with more intensive BUR4 perception. Hence, firms can indicate better MARI performance in the case of having a less intensive perception of FINR. Therefore, this paper does not support the H4 hypothesis, which presumes a more intensive perception of business risk by firms in economic crises and their MARI activities.

Tab. 7. The results for FINR and MARI

Variable	Estimate	S.E.	Wald	df	p-values	95% CI [Lower	Upper]
MODEL-1							
MARI = 1	0.281	0.110	6.564	1	0.010	[0.066	0.495]
MARI = 2	1.116	0.114	96.629	1	0.000	[0.894	1.339]
BUR4 = 1	1.506	0.119	161.259	1	0.000	[0.957	1.481]
BUR4 = 2	0.336	0.152	4.910	1	0.027	[0.039	0.633]

Source: created by the authors. Note: S.E.: Standard Error. df: Degree of freedom. CI: Confidence intervals

Discussion

As already mentioned in the Results section, this paper confirms the negative impact of a more intensive perception of business risk by firms during and after the COVID-19 pandemic, the war between Russia and Ukraine, the increase in energy prices, and the economic recession period on the MARI performance of firms. Thus, firms that more intensively perceive business risks in tough economic conditions, such as the COVID-19 pandemic, war, energy, and economic crises, are less likely to indicate greater marketing innovative performance than their rivals and are less likely to apply MARI activities. Unlike other studies that prove the positive relationship between more intensive perception of business risk during and after health (Wang et al., 2020; Caballero-Morales, 2021; Ding & Li, 2021; Ozili, 2021; Greco et al., 2022; Huang et al., 2022; Naisa et al., 2023; Nazli, 2024; Rishi et al., 2024), political (Zlatova, 2022; Ilchuk et al., 2023; Oklander et al., 2024; Nazli, 2024), energy (Verdolini & Galeotti, 2011; Aghion et al., 2016; Ley et al., 2016; Van Leeuwen & Mohnen, 2017; Ghallabi et al., 2025), and economic crises and MARI activities of businesses (Naido, 2010; Medrano & Olarte-Pascual, 2016; Cucculelli & Peruzzi, 2020; Wziątek-Kubiak & Pęczkowski, 2021; Moiseev et al., 2023; Yao & Li, 2023).

On the other hand, the findings of this paper are compatible with the studies of Makovec Brenčič et al. (2012), Boyer and Blazy (2014), Soltmann et al. (2015), Cohen et al. (2017), Korneyev et al. (2022), Tran et al. (2022),

and Hatab and Lagerkvist (2024) since these studies also verify the negative relationship between more intensive risk perception and MARI activities. For instance, Makovec Brenčič et al. (2012) declare that firms reduce their R&D budgets and innovation activities because they perceive these actions as insufficient to apply during economic crises. Soltmann et al. (2015) outline that innovative activities are insufficient tools for firms to implement during increases in energy prices. Similar to Soltmann et al. (2015), Cohen et al. (2017) also infer that businesses' new product innovation activities are not an effective response to increases in energy prices. Thus, firms being informed about this fact might not be interested in applying product innovation activities during periods of energy price increases. Moreover, Korneyev et al. (2022) emphasize the risky nature of MARI activities for businesses, as they increase the costs of firms during the war period. Boyer and Blazy (2014) reveal that innovation intensity causes a greater risk of failure for firms and increases bankruptcy risk for businesses. According to Hatab and Lagerkvist (2024), the business risk caused by the war has also made businesses reluctant to apply some MARI activities, including changes in production, processing, marketing campaigns, and distribution, as firms encountered higher costs and expenses. Tran et al. (2022) also underscore the importance of the economic performance of countries to stimulate the innovation activities of firms. Thus, when firms have a positive perception of the economic conditions of countries, they may be more inclined to take innovative marketing actions.

As already highlighted, this paper corroborates the greater MARI performance of businesses that have a less intensive perception of business risk in the COVID-19 pandemic, the war, the energy and economic crises periods. The geographical scope of companies' activities might be the reason for these results. This is because even though a country faces an economic crisis or recession, firms operating in that country might do business in other countries to diversify their risk and reduce the variability in their profits. Moreover, firms' geographic scope has a positive impact on the introduction of MARI activities. Thus, a broader geographic scope of businesses motivates them to adopt more MARI activities (Medrano & Olarte-Pascual, 2016). According to the research data, 730 firms (53.40% of the entire sample) operate internationally by employing various strategies, including export, FDI, franchising, and licensing. In this regard, the greater geographical activities of those firms might have led them to perceive business risk less intensively, thereby encouraging them to adopt MARI activities.

The trade-to-GDP ratio might also be a good indicator to support a less intensive perception of business risk by the analyzed firms. This ratio indicates the share of the total amount of exports and imports of products and services in a country's GDP. Concerning the analyzed countries where businesses are located, their ratio has fluctuated during the COVID-19 pandemic, the war, and the energy and economic recession periods. For instance, while the value of Czechia from trade to GDP ratio has differed between 133.15% and 152.92%, the volumes of Slovakia have changed between 168.48% and 203.95% between 2019 and 2023. When it comes to other countries, the volume of Poland in this period has been between 100.32% and 123.98%, while Hungary has had values between 155.42% and 185.27%. These volumes may represent continuous international trade activities of firms, and their less intensive perception of business risk may have led them to engage in international transactions.

Although some of the businesses analyzed in this paper have less intensive business risk and indicate greater MARI performance than their rivals in the same industry, the remaining firms have a negative perception regarding tough economic times, including the crises, the war, and the COVID-19 pandemic period. In this regard, some policies can be implemented to reduce the concerns of such businesses. For instance, businesses operating in the Information and Communication Technology (ICT) industry have provided technology services, including artificial intelligence and robotics, as well as cybersecurity, which have grown under economic recessions, especially during the COVID-19 pandemic (Huang et al., 2022). In this regard, policymakers can stimulate collaboration between firms from the ICT and iron and mining industries to help these businesses remain competitive and resilient in difficult times. For instance, Amazon provided its internal IT infrastructure to host the websites of other businesses and fulfilled their IT needs (Chesbrough, 2020). Thus, governments might benefit from such a case to motivate other businesses' mutual activities. Since some MARI activities, such as product innovation, require the usage of new technologies, firms' MARI activities can also be developed through their cooperation with ICT firms. For instance, firms can find partners to assist with search engine marketing strategies, social media campaigns, and the development of new applications.

Moreover, policymakers can establish more departments in various universities to promote the adoption and use of ICT in the iron and mining industries. These departments can also include some marketing-related courses to educate university students regarding marketing innovation more intensively. By being well-educated and well-skilled in those areas, the young generations can become capable of generating crucial solutions for businesses in tough economic times.

Conclusions

Although health, political, energy, and economic crises create tough economic conditions and cause greater business risk for enterprises, their dynamic capabilities based on RBV might reduce their concerns about long-term survival. This is because, as a dynamic capability, MARI activities enable businesses to become more

competitive against their rivals, increase their income, and increase their recovery in the ongoing and post-crisis periods. In line with these arguments, this paper examines whether a more intensive perception of business risk by firms in response to challenging economic conditions, such as COVID-19, the war between Ukraine and Russia, rising energy prices, and economic recessions, affects their propensity to engage in MARI activities.

The researchers analyze 1367 firms, including SMEs and large companies from Czechia, Slovakia, Hungary, and Poland, to hit this research target. The research sample includes some firms operating in the iron and mining industries as well. While the research team collects data by internet-mediated questionnaire, it employs Ordinal Logistic Regression tests to perform the research's analyses. The results substantiate a positive relationship between less intensive perception of business risk in those periods and MARI. Thus, respondents who perceive business risk more intensively perform fewer MARI activities, and vice versa. The geographical scope of firms' activities may be the reason for greater MARI activities among firms with less intensive business risk. Since the majority of firms in the research data operate in different countries, their risk diversification approach may reduce their concern for business risk, motivating them to perform MARI activities. The collaboration of firms from the iron and mining industries with ICT firms can not only improve the resilience of businesses during crisis periods, but also reduce their concerns about job losses. Policy makers can also offer new interdisciplinary programs in universities to educate students about the use of ICT and marketing innovation in various industries, including iron and mining.

Although this paper concentrates on various health, political, energy, and economic crises and focuses on the risk management and marketing innovation capabilities of RBV, which are proactive tools for crisis management, this study has some limitations. Firstly, this paper analyzes firms from only four Visegrad countries that have cultural and socio-economic similarities. In this regard, further studies can include firms from countries that indicate greater socio-economic and cultural differences. Moreover, the reasons the researchers suggest are based solely on a firm's location, geographical scope, and industry. By including more firms from various countries, new studies can explain their results with cultural, economic, legal, and political differences that are explained by Institutional Theory. Since this paper is also limited to the dynamic capabilities of RBV, integrating various theories (such as Institutional Theory) into a new study can expand the theoretical scope of future research. Although this paper analyzes MARI and business risk management (including financial risk) activities, the results are based solely on the survey participants' perceptions. Thus, the research data does not include hard data such as financial statements, the amount of marketing expenses, and innovation investments. For this reason, further studies can collect hard data to not to have such a research limitation.

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