

Threats In International Logistics – Study During Covid-19 Pandemic Time*

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* Presented at the 37th IBIMA International Conference, 30-31 May 2021, Cordoba, Spain

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Abstract

International logistics processes and global supply chains have been interrupted or even broken by the results of Covid-19 pandemic. The enterprises have to face new threats for their functioning. Therefore, the main objective of the study is to identify the risk factors that have the greatest impact on destabilizing the international logistics of enterprises and their supply chains. In addition, the research intends to show the attitude of enterprises to outsourcing and defines the most frequently used indicators; they are used as measures in the processes of measuring the level of achievement of the organization's goals (KPI) by respondents. The research sample covers 86 enterprises of all sizes operating in various economic sectors. The results of the research create a list of the most prevalent threats occurring in the economic environment, the ways in which the enterprise prevents the occurrence of such a risk and the ways of dealing with the already existing risk. The findings of the study also reveal the respondents' attitude towards outsourcing.

Keywords: International Logistics, Threats, Management, Risk

Introduction

In both interregional and international trade, logistics services have been an important human activity throughout history. Particularly, the rapid developments of globalization and trade liberalization have highlighted the roles of transportation (Kumar and Hoffmann, 2002). Modern logistics is greatly influenced by the processes of globalization and internationalization. In the rapidly developing process of globalization concerning the economy, transportation management issues are of great importance. The development of global economic integration and the globalization of business contribute to the creation of international logistics systems and global supply chains on the international market. International logistics is fundamental to the internationalization of enterprises. Its essence concerns the links between enterprises within the economic systems of different countries. The content of these links is trade with which the flow of goods or services is always connected. International logistics is also understood as a two-part process consisting of managing the movement of products across the borders of countries or regions. The first part consists of internal processes in the host countries. The second section consists of international processes. Another concept of international logistics is the management of the international supply chain, understood as a combination of the logistics activities of companies -- the links in this chain, especially the operational, financial and marketing functions, as well as the control of the physical flow of goods, money, and information through and across borders. International logistics has two distinct macroeconomic and microeconomic aspects. The macroeconomic aspect concerns the creation of logistics systems in which international logistics can be considered an integration platform for globalizing business. The microeconomic aspect allows us to treat international logistics, understood as a method of managing transnational supply chains, in terms of a systemic tool supporting and optimizing foreign trade processes. International logistics has several distinctive features. Among other things, it is the multiple crossing of state borders by goods, which is associated with additional fees (e.g. customs), delays and inhibitions of material flows. Circulating

freight routes around the globe, crossing many climatic zones using a variety of modes of transport and different storage and storage systems. International logistics networks (design aspect) are the issue of substitution between the expenditure on logistics and expenditure on production, service and sales. It is worth noting that the change like the flow of physical goods from local to global currently constitutes a significant part of all logistics operations. It is translated into an increase in the number and scale of potential disruptions and negatively affecting the implemented processes. Disturbances related to the impact of factors that are difficult to predict in the near and distant environment, as well as within the logistic chains themselves, cause significant deviations in material flows. Research conducted in this area shows that in many cases, they negatively affect the entire functional system of a given entity (influenza), causing a number of adverse effects. Risk management is a daily issue in international logistics management. The ability to respond and mitigate the effects of these risk events allow the company to stay ahead of competitors and reduce expected long-term damage to its business. The work concerns a very current issue related to the functioning of international logistics in enterprises during the COVID-19 pandemic. The development of this situation creates new threats or changes the impact of current threats, including financial, personal or sales problems. This phenomenon has a direct impact on the stability of the demand function and often creates a problem in the functioning of any type of logistics. By conducting research with enterprises, you can find out how intense the impact of a pandemic is on the functioning of the enterprise and its various teams, such as international logistics. The research also shows the attitude of enterprises to the threats or their acceptance. Ways of preparing for the future and forecasting entrepreneurs related to the probable occurrence of threats. In addition, the work shows the attitude of entrepreneurs to outsourcing (general) as well as in the times of the current pandemic, and identifies the most commonly used KPIs to measure the level of achievement of goals and assumptions by a given organization.

The work concerns a very current issue related to the functioning of international logistics in companies during the COVID-19 pandemic. The development of this situation creates new threats or changes the impact of existing threats, including financial, personal or sales problems. The main objective of the study is to check how the COVID-19 pandemic affects the stability of the supply chains of the surveyed companies and how intense this impact is. The work identifies hazards and their consequences that most respondents believe are the most onerous or most likely to occur. In addition, it indicates the most popular activities aimed at securing the enterprise against negative effects.

Literature Review

Transport and logistics services facilitate international trade and play an important role in the growth and development of the local economy. The quality and efficiency of logistics services can matter for international trade as a weak logistics infrastructure, and operational processes can be a major obstacle to global trade integration (Devlin and Yee, 2005). With the global fierce competitive business environment, international logistics capacity is becoming an inevitable countermeasure for international enterprises to meet the challenges of managing globe-spanning supply chains successfully (Hohenstein et al., 2016). Major international market trends, involving supply chain management, transportation, and information technology, are changing how logistics is practiced and taught (Murphy and Poist, 2006, Thai et al., 2011, Thai, 2012). International logistics connect critical elements of supply chains, impacting global and national economies as well as firms and multinational enterprises (Nicita et al., 2013; UNCTAD, 2019a). Delays in international logistics systems can stem from natural and environmental disasters, trade and tariff tensions, material and equipment unavailability, transportation and labor disruptions, disconnects between modes and transportation systems, loss, damage and theft of material, equipment and systems (Fartaj et al., 2020; UNCTAD, 2019a). Global events, such as the COVID-19 virus outbreak, have also disrupted international logistics systems in ways and scales not anticipated before (Anjumohan, 2020; McKibbin and Fernando, 2020; Ivanov, 2020). International logistics as well as global supply chain are affected by two dynamic factors like globalisation process and information technology development. The dynamics of the first factor provide guidelines to new forms of competition and new production locations, as well as influence the level of relative costs and the market size. The impact of information technology is even more pervading than globalisation itself, as it ensures global communication, enables process automation, changes the hitherto nature of business and creates new industrial branches. The merging of computers with telecommunications has changed the way people work and connect the entire world. Furthermore, the speed and unpredictability of environment changes cause managers to design only temporary and extremely adaptable solutions, characterised by fast responsiveness to market needs (Scharpy and Skjott-Larsen, 2001). The current studies of risk identification have focused on the modeling of integrated information, management framework, risk and decision of supply chain information supported by the perspective of the whole supply chain of perishable products (K. Patil 2014; Y. Kristianto 2014; T. Kosztyán 2016). Most of the modeling methodologies concentrate on collecting single information, such as time-temperature information, which is used for risk identification (A. Musa 2014; M. García 2017; Y. Zhu 2016; T. Tsironi 2016; M. Aung 2014). Drivers such as sustainability, responsiveness and risk management are today a reality that needs to be accounted while developing decision-supporting tools to inform supply chains activities (Barbosa-Povoa, 2014). Bogataj and Bogataj (2007) have defined risk as the potential variation of outcomes, and it influences the decrease of value-added of any activity in a supply chain. Risk is defined as potentially important or disappointing results of implemented decisions (Sitkin and Pablo, 1992), and supply chain risk is defined as an event that adversely affects supply chain operations; hence its desired performance measures cost, chain-wide service levels and responsiveness (Xie, C et al., 2011). According to Finch (2004),

threats within international logistics chains can be divided into three levels, such as application, organisational and inter-organisational. First level threats on the application are as follows:

- natural disasters (e.g. floods, thunderstorms, breakdowns of electricity, epidemics, etc.)
 - illegal acts (e.g. sabotage, theft, terrorism, vandalism, smuggling, etc.)
 - low confidential data security (e.g. hacker intrusions into systems, viruses, etc.)
 - unsuccessful management (e.g. wrong decision making)
 - other accidents (e.g. fire, badly designed, constructed and maintained buildings, human errors, etc.)
- Secondly, on the organisational level, companies encounter a significant number of other threats, in addition to the mentioned first level threats, which arise in relation to (Finch, 2004):

- legislation (e.g. breaching of intellectual property rights)
- strategic decision making
- lack of investment in maintaining competitive advantage
- changing bargaining power

According to the author, the last level or the inter-organisational level includes all threats of the first two levels, as well as the threat of weak and inefficient company control over the operations of its suppliers, customers and the entire logistics chain. This threat occurs due to increasingly intensive networking of companies. Increasingly interconnected global supply chains make cyber-attacks, digital failure and geopolitical dynamics an ever-present set of risks to business integrity. Future competitiveness relies on deep integration between all parts of the manufacturing, logistics and distribution sectors, with highly automated processes requiring massive levels of data being exchanged, leading to a concordant increase in vulnerability to privacy and security breaches. Further, reliance on partners and changing customer demands increase the potential for market and business model failure. The high demand for new technological skills, especially digital leadership and big data analytics, compound the sector's challenges. In the literature, the subject of threats related to international logistics and their consequences has been discussed many times. There were also presented ways of dealing with threats and ways to protect oneself against possible future emergence of threats. However, few works deal with this topic in terms of the crisis situation which we are undoubtedly dealing with on an ongoing basis. The COVID-19 pandemic has brought new realities that could be the beginning of a specific research gap, which should be explored and supplemented with new information - by examining in detail the functioning of international logistics structures based on the reflections and experiences of entrepreneurs struggling with the threats brought about by the pandemic.

Research Methodology

The survey was conducted in order to identify the most common risk in the economic sphere. The survey was to determine which risk may have the most significant negative impact on the functioning of business and the functioning of the supply chain. Its task was also to check the frequency of occurrence of a given threat, determine the most frequently used methods of coping with risk and its prevention, as well as the attitude of respondents to outsourcing and the most frequently chosen indicators as measures in the processes of measuring the degree of achievement of the organization's goals (KPI). The 86 companies participated in the study from various countries, including Poland (36), Turkey (26), and India (24). There were 13 questions in the survey. The survey questionnaire was created based on website, and due to the restrictions related to the COVID-19 pandemic, 180 invitations to participate in the survey were sent by e-mail so respond rate was quite low 47,8%. The survey was conducted in October, 2020.

Research Results

As the detailed analysis showed no significant differences between answer form enterprised located in studied countries so the authors decided to analyse results in one sample.

Considering the number of employees, the largest number of companies are small enterprises employing from 10 to 49 employees (39%). The second most numerous are micro-enterprises employing from 1 to 9 employees (28%), followed by large companies from 50 to 250 employees (21%), and the smallest group of respondents are large enterprises with more than 250 employees (12%) (Figure 1).

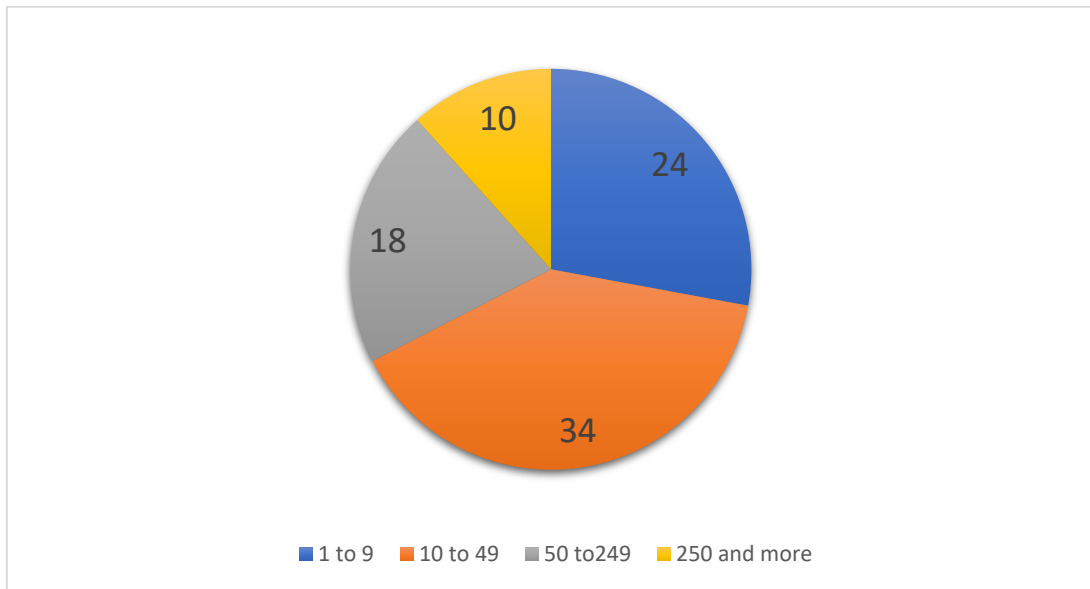


Figure 1: Number of employees

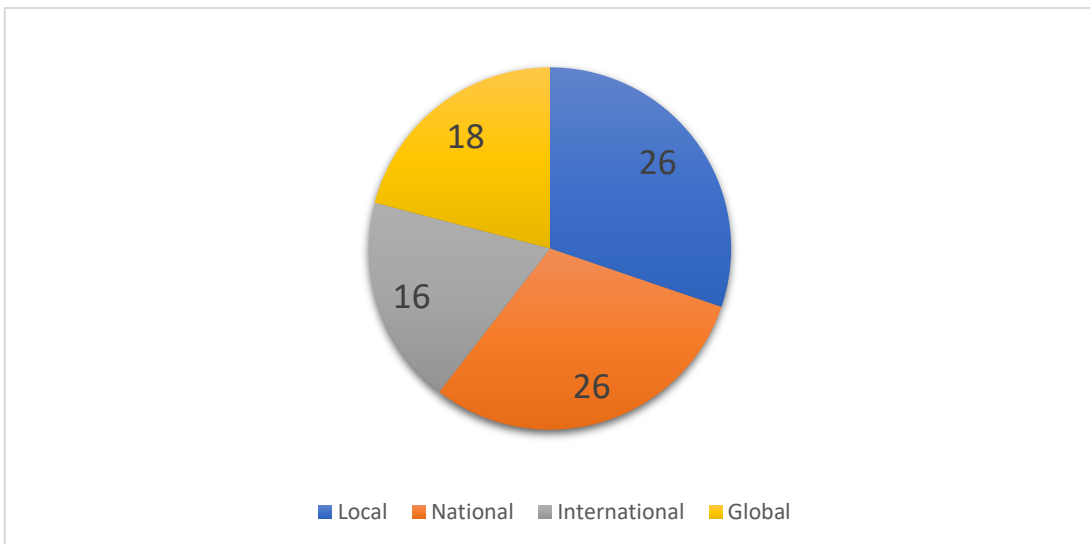


Figure 2: Operational types of enterprises

The survey has shown that among the surveyed enterprises, the largest percentage of them operates at the local (30.2%) or national (30.2%) level. International companies account for 18.6%, respectively, and global 20.9% (Figure 2). In fact the research has shown that 30.2% of the surveyed enterprises operate on the local market. This question refers to the relationship between the enterprise and customers, only. However, these companies make their operation dependent on supplies from outside the country so they are depended strongly on international logistics as well.

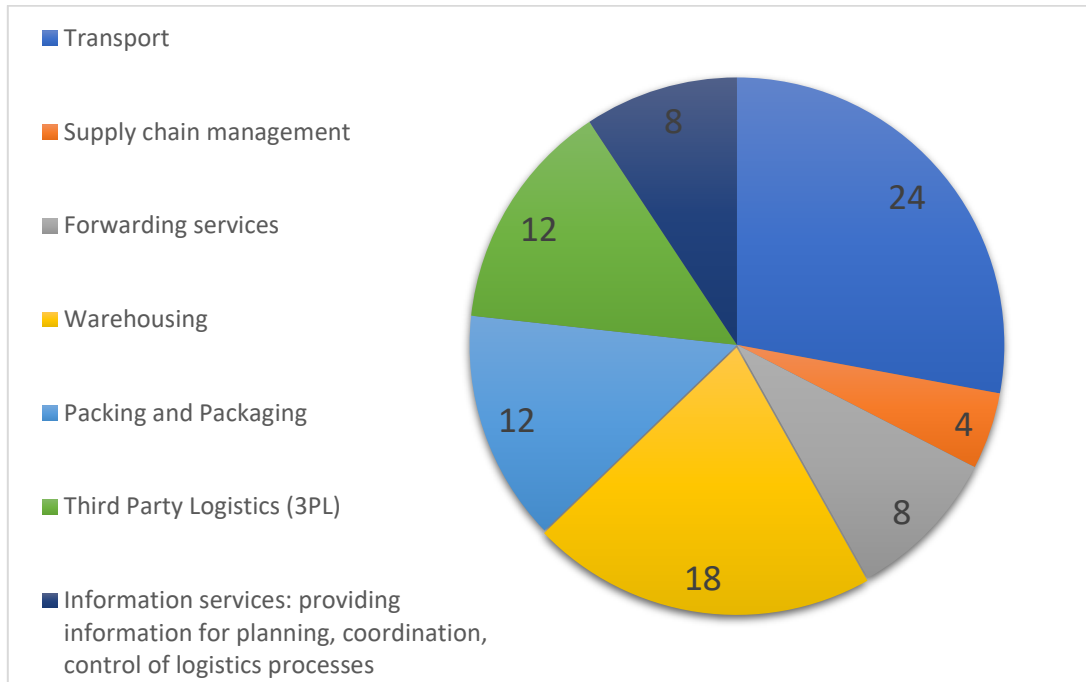


Figure 3: Business profile of company

Referring to the scope of operations of logistics companies, most of the respondents deal with Transport and Storage (27.9%) (Figure 3). Another considerable large group of companies functions with the scope of activities of Warehousing (20.9%). Less numerous groups are companies in the field of information and forwarding services in the amount of 10% and (4.7%).

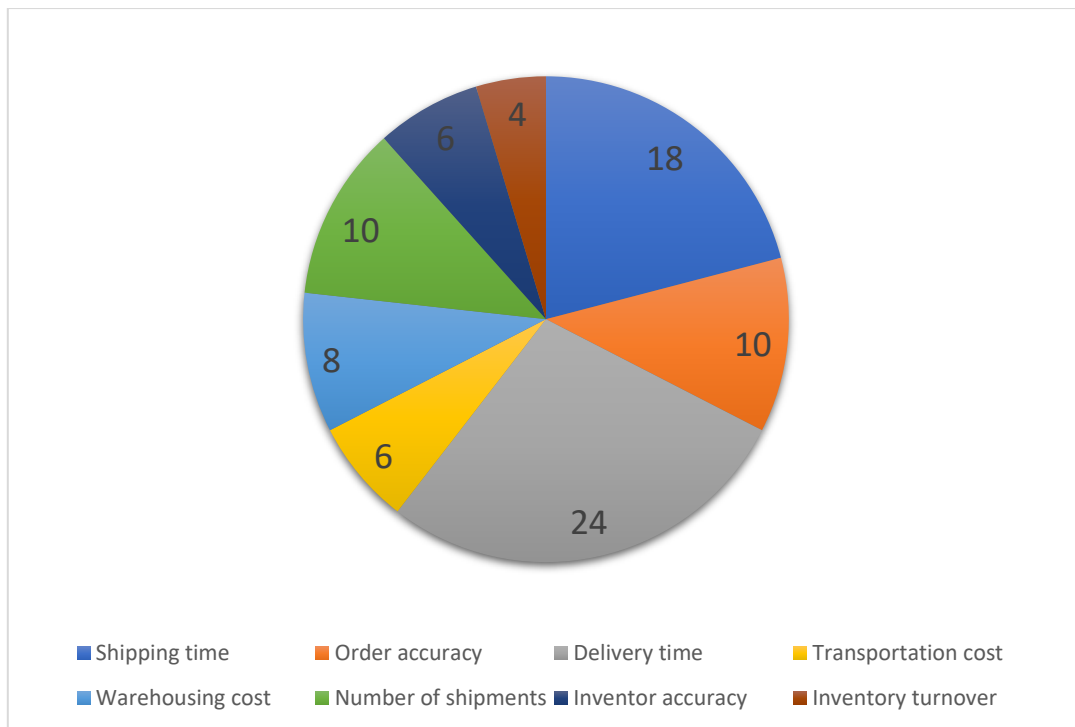


Figure 4: The most important logistics KPI

For the surveyed companies, the most important KPIs are delivery time (27.9%), shipping time (20.9%), order accuracy and number of shipments (11.6%). For fewer companies, storage costs (9.3%), transportation costs and inventor accuracy (7.0%), inventory turnover (4,7%) are more or less important. The inventory to sales ratio is not an important factor for any company (Figure 4).

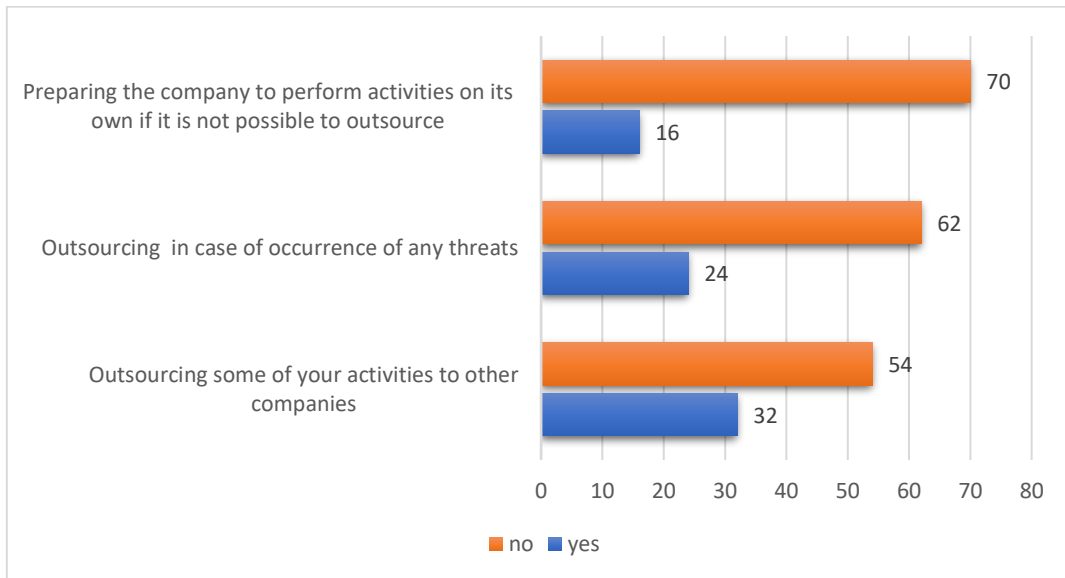


Figure 5: Outsourcing opinions in surveyed companies

Furthermore, over half (62.8%) of the surveyed companies outsource part of their business to other companies. In case of any threats, up to 72.1% of companies are ready to outsource, and 81.4% of companies are prepared to independently carry out activities previously outsourced to other companies (Figure 5).

Table 1: Level of the impact of companies' threats categorized from 1 to 5 (1- no impact; 5-significant impact)

	1	2	3	4	5
Political instability	8	10	42	16	10
Trade restrictions	12	12	16	26	20
Terrorism	14	18	22	20	12
Corruption	10	10	26	26	14
Theft and illicit	8	36	28	18	14
Piracy	18	22	18	16	12
Demand shocks	6	14	30	16	20
Price Volatility	4	14	30	16	20
Border delays	4	20	24	22	16
Currency fluctuation	6	14	30	20	16

Energy shortages	8	14	38	22	4
Nature disasters	8	20	30	14	14
Extreme weather	6	14	40	16	10
Pandemic	10	12	20	22	22
ICT disruptions	12	20	36	16	2
Infrastructure failures	8	28	24	22	4

Table 1 shows the strength of the various threats to running a business and supply chain. It shows that the most significant threats are trade restriction (53%), pandemics (51%), border delays (44%), demand shocks and price volatility (41%). However, they do not know about the risks associated with extreme weather (46%) and political instability (48%). However, according to the respondents, threats such as theft and illicit (51%), piracy (46%) and terrorism (37%) will have little impact (see Table 1).

Table 2: Probability of the appearance of the companies' effects associated with threats (1- no probability; 5- high probability)

	1	2	3	4	5
Reduction of employees	8	16	24	14	24
Loss of orders	12	6	24	26	18
Inability to complete the orders taken before	4	20	38	20	4
Reduction of salaries	10	16	32	18	10
Loss of financial liquidity	4	14	28	22	18
Change of business profile	4	22	38	14	8
Insolvency	12	20	34	16	4
Lack of demand for goods/services	2	22	30	28	4
Closing the company	20	20	26	10	10

Respondents of the present study reveal that the likely effects that may occur after the risk occurs (Table 2) are: reduction of employees (44%), loss of orders (51%) and loss of financial liquidity (46%). The findings of the research show that a significant proportion of respondents do not know whether there may be effects in the form of inability to complete the orders taken before (44%) or change of business profile (44%) or insolvency (39%) or reduction of salaries (37%). On the other hand, it is unlikely that the company will close (46%).

Table 3: Potential of changes resulting from the occurrence of the threats in company.

	Low	Not much	High
Research and development	12	60	14
Production	18	36	32
Marketing	8	36	21
Sales	12	42	32
Services Management of processes inside the company	24	32	30
Customer relationship	10	36	40
Time management	16	46	24
Supply chain	20	36	30
Transport	22	32	32
Warehousing and inventory management	30	38	18
Packing and packaging	26	34	26

In addition, the companies participating in the survey indicate the potential for change resulting from the occurrence of threats in their companies (Table 3). According to the respondents, marketing had the highest potential for change. The average potential is related to research and development, sales, time management, production, customer relations, packaging and supply chain. The lowest potential is demonstrated by the departments of warehouse and inventory management, management of process services within the company and transport.

Table 4: Preparing the company for the following threats

	Yes	No
Political instability	54	32
Trade restrictions	68	18
Terrorism	40	46
Corruption	48	38
Theft and illicit trade	31	24
Piracy	38	48
Demand shocks	62	24
Price Volatility	62	24

Border delays	48	38
Currency fluctuation	40	46
Energy shortages	60	26
Nature disasters	30	56
Extreme weather	30	56
Pandemic	52	34
ICT disruptions	26	60
Infrastructure failures	56	30

Moreover, the vast majority of companies, as much as over 50%, are ready for trade restrictions, political instability, demand shocks, price volatility, border delays, energy shortages, pandemics and infrastructure failures. However, they declare that they are not ready for terrorism, piracy, exchange rate fluctuations, natural disasters, extreme weather conditions and ICT disruptions (Table 4).

Table 5: Type of activities of the company to prevent negative effects caused by any threats

Creating financial reserves	34
Preparation for a quick change of business profile	24
Increase of warehouse stocks	32
Conversion of some fixed costs into variable costs	22
Creating the opportunity to change the market	18
Minimizing the number of employees	26
Employing only qualified employees	12
Other	0

The companies chose what action they would take to prevent the negative effects of any threats. The largest number chose to create financial reserves (39.5%), increase inventory (37.2%), prepare for rapid change of business profile and minimize the number of employees (30.2%). The lowest amount concerns the conversion of some fixed costs into variable costs (25.6%), creating the opportunity to change the market (20.9%) and employing only qualified employees (14.9%) to prepare for the occurrence of threats and quick response (Table 5).

Results Discussion

The responses of the respondents have shown that, regardless of the sector of the economy, enterprises have to deal with the risk, which has its source well-grounded in various factors. The risk that may have the greatest negative impact on both

internal and external functioning is the restriction of trade, the pandemic in this case strongly associated with the COVID-19 virus delays at the borders, as well as demand shocks and price volatility (Zandi et al., 2020; Sawangchai et al., 2020; Kuzmenko et al., 2020). However, research shows that, according to the respondents, the risk/threat in the form of theft and illicit, piracy or terrorism is a low probability. Moreover, the responses indicate the respondents' unawareness in the face of threats conditioned by extreme weather and political instability. When asked about the effects of any risk, most respondents point to reduction of employees, loss of orders and loss of financial liquidity. About half of the respondents claim that it would be impossible to close the enterprise due to any risk. There is also a certain proportion of the respondents, about 30%, who are not aware of the occurrence of such effects as inability to complete the orders taken before, change of business profile, or insolvency or reduction of salaries. Besides, the companies participating in the study indicate the potential for change resulting from the presence of threats in their companies. The most significant potential for change is to be related to marketing, while the average aspects are research and development, sales, time and production management or customer relations. The warehouse and inventory management sections show the lowest potential. The next question has given an answer on whether companies are prepared for possible threats. More than half of the enterprises are prepared for the risk of political instability, trade restrictions, corruption, demand shocks, price volatility, border delays, energy shortages, pandemic and infrastructure failures. On the other hand, there is also a significant part of enterprises, which claim that they are not prepared for the threats of terrorism, piracy, currency fluctuation, natural disasters, extreme weather and ICT disruptions. The survey has also asked about the measures taken to prevent the occurrence of negative risk effects. The most common option is creating financial reserves, increasing warehouse stocks, minimizing the number of employees, employing the least qualified employees and creating the opportunity to change the market. The survey has also asked questions about outsourcing companies. More than half of the respondents replied that they outsource some of their activities to other companies and continue this process even in the event of a risk, and the vast majority of respondents replied that they are prepared to handle these cases when outsourcing with other companies is discontinued. The survey has also included a question about KPIs. According to the respondents, the most important indicators are delivery time, shipping time, accuracy of the order and the number of shipments. On the other hand, the least important things are accuracy of inventory, transport cost and inventory rotation.

Conclusion

Running a business is inextricably linked with risk. Therefore, while setting up a business, it must be always remembered that there will be many dangers waiting for us. Of course, there will be many gains on the other side, but the loss is always real. There are many factors that influence running a business. They include, among others, microeconomic and macroeconomic factors, which include, for example, market demand, inflation, exchange rates and changes related to the economic situation. Every responsible entrepreneur or person who is just planning to start a business should take actions that will reduce the level of risk and thus affect the achievement of success. Every company that works effectively and focuses on its development should carefully analyze the market and the dangers that lie ahead. The awareness of their occurrence allows managing the activities in such a way that the business can be partially protected against the risks. Considering the multitude of dangers and the fact that their analysis often requires specialist knowledge, it is important to use the services of companies that professionally protect the interests of their clients. In this way, the entrepreneur can focus on the "core" of running his/her business, and entrust the issues related to the market analysis and the dangers to the specialists. The crisis situation is also not conducive to the free conduct of international logistics. It causes destabilization of logistic chains at every level. The research has shown the multitude of threats in the aspect of international logistics in various forms. By focusing on logistics and transport itself, there are two main threats that were most often chosen by respondents as having the greatest impact on the company, namely border delays and trade restrictions. It is inevitably linked to the state's policy itself and its destabilization. Many countries have taken measures such as border closure or restricted border traffic as a means of slowing the spread of the COVID-19 virus or trying to eliminate it. Air traffic has also been completely or partially halted in some countries. All these factors cause delays in supply chains or their complete interruption for some time, thus delays in production and processing. However, the above-mentioned factors are the basis for unpleasant consequences such as reduction of employees, loss of some or all orders and orders, loss of recipients or loss of financial liquidity, which may later contribute to the forced changeover or bankruptcy of the company. The above information is also confirmed by the respondents' answers to the question which sectors of the company will be most affected by the pandemic, and these are: customer relationships, production, sales, transport, supply chain. Despite the severe crisis situation, more than half of the respondents admit that they are prepared for the effects of trade restrictions, border delays or in the event of a pandemic itself. However, these are only words and the development of the current situation will allow for their verification, which could be the basis for further research. Entrepreneurs also declare that they have taken many actions to minimize the effects of threats, the most frequently chosen by respondents include: creating financial reserves, increasing stock levels or preparing for a quick change of the business profile. The respondents rarely declared that they employ qualified staff. Employing only qualified employees would make it possible to reduce the number of employees, and thus the effect of the pandemic, such as layoffs, would be minimized. On the other hand, another activity rarely chosen was creating the possibility of changing the market. It would be a good idea to have alternative outlets or alternative suppliers. There has always been an additional alternative when the current unions were unable to do so.

However, more research and analyzes are needed to update and correct the newly created outline of information on an ongoing basis, because every day the pandemic situation changes, there are new lockdowns, closing borders and thus new threats giving negative impulses for logistics chains.

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