

Importance of Physical Customs Control Risk Management: A Comprehensive Approach

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Abstract. *Risk management in physical control is essential for protecting the integrity of customs operations and maintaining economic security and order. In Romania, customs control has the role of enforcing legislation on the trafficking of goods and people, preventing smuggling and tax fraud, and protecting the interests of the state. Total control checks exhaustively, but involves high costs, and the lack of control is rare and relies on trust. This research carries out an assessment of the risks of physical customs control using the risk matrix, risk maps and bow-tie diagrams. The results show that the most severe risks are the risk of irradiation, the risk of contamination and the risk of cutting. The limitations refer to the fact that the research was carried out at national level.*

Keywords: Strategy, management, physical customs control, smuggling, trade, monitoring.

Introduction

In the context of globalization and international flows of goods and people, risk management in physical customs control has become an essential element for ensuring economic security and public order (Fabbri, 2020; Galaz et al., 2021). On the one hand, customs authorities must identify and prevent threats associated with illicit trafficking in goods, tax fraud and other violations of the law. On the other hand, they have the responsibility to facilitate legitimate trade and avoid unnecessary delays at the border (Ivascu & Cioca, 2014).

In Romania, the relevant legislative framework in the customs field is represented by the Romanian Customs Code, regulated by Law no. 86/2006, which establishes the principles, procedures and responsibilities of the institutions involved (Law no. 86/2006). Effective risk management therefore involves the integration and coordination of resources, skills and information into a coherent system, capable of dynamically responding to the current challenges of the economic and security environment (Pislaru et al., 2018; Pislaru & Trandabat, 2012).

This article aims to address the physical dimension of customs control from the perspective of risk management, highlighting the techniques, technologies and strategies used to optimize border surveillance. Thus, concepts such as full control, random control, observation control and, last but not least, situations in which there is no formal control will be analyzed. At the same time, emphasis will be placed on how the information provided by risky departments can contribute to strengthening operational capacity and the efficient allocation of resources. Physical customs control plays an essential role in protecting national borders and ensuring compliance with international trade and security regulations. This process involves the physical inspection of goods, vehicles and people transiting border crossing points, with the aim of preventing fraud, smuggling and other illegal activities. In this context, the application of

effective risk management strategies is essential to optimize the use of customs resources and improve operational efficiency.

Risk management in physical control is essential for protecting the integrity of customs operations and maintaining economic security and order. In Romania, customs control has the role of enforcing legislation on the trafficking of goods and people, preventing smuggling and tax fraud, protecting the interests of the state (Alina et al., 2021; Bhatta et al., 2023; Pâslaru et al., 2008). Total control checks exhaustively, but involves high costs, and the lack of control is rare and is based on trust. Control by observation and sampling optimize resources and maintain the flow at the border (Borysenko et al., 2022; Dionne, 2013; Ivascu & Cioca, 2014; Medin, 2021; Shubailat et al., 2024). By observation, personnel and technologies directly monitor suspicious activities, and by sampling, periodic and selective checks are made based on risk analyses. The Risk Department evaluates profiles and trends, facilitating the targeted selection of transports and people. Risk management supports the fight against illegal activities, border security and fluid, predictable trade. By constantly modernizing methodologies and technologies, risk management remains a crucial pillar, ensuring the balance between security and facilitating legitimate traffic. Thus, countering risks supports compliance with international norms (Fedotov & Zotenko, 2020). All these risk management activities contribute to the development of global, regional and national sustainability (Cioca et al., 2019; Sun et al., 2022).

The purpose of this article is to analyze and highlight the importance of risk management in physical customs control, focusing on the activities, strategies and technologies used to identify and reduce the risks associated with the international transit of goods. In a globalized context, where trade flows are increasingly complex, physical customs control must be efficient and well-structured, so as to allow both to combat customs fraud and smuggling and to facilitate legitimate trade.

Specifically, this article aims to provide an approach based on data and international regulations to improve risk management in customs control. It will analyze both current challenges and international good practices, highlighting the role of technology and international cooperation in increasing the efficiency of the control process.

The paper is structured in two main parts, the first part includes a review of the specialized literature and the second part the results obtained in the risk assessment stage.

Literature review

Physical customs control management represents the integrated set of policies, procedures and instruments through which customs authorities monitor, control and regulate the flow of goods and people at borders, in order to ensure security, protect economic interests and guarantee compliance with national and international legislation (World Customs Organization, 2018; Law no. 86/2006; Kieck, 2010). Through these measures, the aim is to prevent and combat illicit trafficking, collect customs duties correctly, and maintain a climate conducive to the development of legitimate trade.

Physical customs control risk management is very important and is addressed in all units. Risk management in customs activities is a systematic process of identifying, assessing and managing threats associated with the transit of goods and people across borders. The main goal is to maximize the effectiveness of customs controls, while reducing the negative impact on legitimate trade flows.

According to the World Customs Organization (WCO), a risk-based approach allows customs authorities to direct resources to areas with the greatest potential for violations of laws and

regulations (WCO, 2018). This ensures a balance between security and the facilitation of international trade.

- **Factors influencing physical customs control**

Effective risk management in customs control is influenced by several factors:

- a) The volume and complexity of international transit – the increase in the volume of goods transported globally has driven the need for advanced solutions for risk assessment (Holloway, 2020).
- b) Emerging threats – digital technologies and organized criminal networks are creating new challenges for customs authorities, including the smuggling of drugs, weapons and counterfeit goods (Interpol, 2021).
- c) International regulations and compliance – European Union member states must comply with the Customs Union regulations and EU customs legislation (EU Regulation No. 952/2013).
- d) Technology and digitalization of customs processes – the use of scanners and artificial intelligence-based systems improves threat detection, reducing the need for extensive physical checks (Balalova & Lagvilava, 2022).

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- **Benefits of Applying Risk Management to Physical Customs Control**

Applying risk management strategies to customs control offers multiple advantages:

- a) Increased operational efficiency – customs authorities can focus efforts on high-risk shipments, reducing processing time for legitimate goods (Zhamaladen, Kairat & Saule, 2019).
- b) Cost reduction – intelligent resource targeting minimizes operational expenses and allows for more efficient use of scanning technology and customs personnel (Barausova et al., 2021).
- c) Improved national security – rapid identification of risks related to cross-border crime, human trafficking, and tax evasion protects a state's economy and stability (Ugryn, Bondarenko & Shevchuk, 2022).

- **Challenges in Implementing Risk Management in Customs Control**

Although the benefits are obvious, there are also major challenges in the effective application of risk management strategies in physical customs control:

- a) Lack of infrastructure and advanced technologies – many states do not have sufficient resources to implement effective risk analysis systems (Drofich, 2023).
- b) Resistance to change among customs personnel – continuous professional training is essential for customs inspectors to understand and apply new risk analysis strategies (Worku, 2021).
- c) Insufficient international cooperation – limited information exchange between customs authorities reduces the effectiveness of combating cross-border crime (Volodymyrovych Nosach et al., 2022).

Methodology

The present research uses the risk matrix to identify, evaluate, analyze and propose methods for dealing with risks in the physical control activity in customs. The research was applied to one of the customs offices in Romania. The entire approach involved all risk management activities

from the identification stage through the interview method to the treatment methods presented in the form of knowledge maps.

A 5X5 risk matrix was used and the entire process was carried out with key people from the physical control activity. 10 important risks were identified for which knowledge maps and bow-ties were created for communication in the decision-making process.

LIKELIHOOD ↓	SEVERITY →				
	1	2	3	4	5
	LOW 1	LOW 2	LOW 3	MEDIUM 4	MEDIUM 5
1	LOW 1	MEDIUM 4	MEDIUM 6	HIGH 8	HIGH 10
2	LOW 2	MEDIUM 4	HIGH 9	HIGH 12	EXTREME 15
3	LOW 3	MEDIUM 6	HIGH 9	HIGH 12	EXTREME 15
4	MEDIUM 4	HIGH 8	HIGH 12	HIGH 16	EXTREME 20
5	MEDIUM 5	HIGH 10	EXTREME 15	EXTREME 20	EXTREME 25

Figure 1. The risk matrix

Results and discussions

This section includes the results obtained in the research activity. The results obtained in all stages of risk management are presented: identification, assessment, analysis and treatment. The main risks identified are risk of contamination, risk of radiation, risk of cutting, risk of falling from vehicles, risk of illness, risk of aggression, risk of electric shock, risk of omission, risk of failure to carry out checks on goods, and risk of poor communication, Figure 2. The physical control activity presents several risks, but they were considered the most important, with the highest severity. The identification stage was carried out together with key people from customs activity.

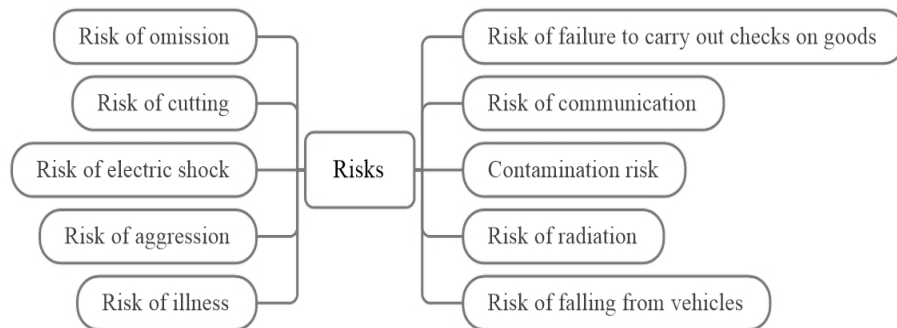


Figure 2. The main risks identified in physical customs control activity

Figure 3 shows the important risks identified. It can be seen that three risks are present in the red zone, four risks are in the high severity zone and three risks are present in the medium severity zone.

LIKELIHOOD ↓	SEVERITY →				
	1	2	3	4	5
1	LOW	LOW	Risk of poor communication	MEDIUM	MEDIUM
2	LOW	MEDIUM	Risk of electric shock	HIGH	HIGH
3	LOW	Risk of falling from vehicles	Risk of aggression	Risk of aggression	EXTREME
4	MEDIUM	HIGH	Risk of omission	Risk of illness	Risk of contamination
5	Risk of failure to carry out checks on goods	HIGH	EXTREME	Risk of cutting	Risk of radiation

Figure 3. The risk matrix for this research

Figure 4 shows the hazards and consequences for the risk of contamination. It can be seen that hazards can develop as a result of organizational deficiencies. The consequences are important, but they cannot be completely eliminated if they occur.

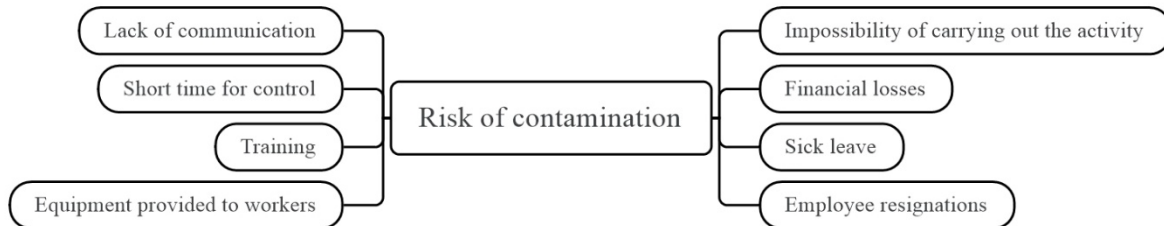


Figure 4. Risk of contamination, associated hazards and identified consequences

Figure 5 shows the hazards and consequences for the risk of radiation. Among the most important hazards are Lack of impact isolation equipment, short time for control, training, or equipment provided to workers. The concessions are important and must be treated by appropriate methods.

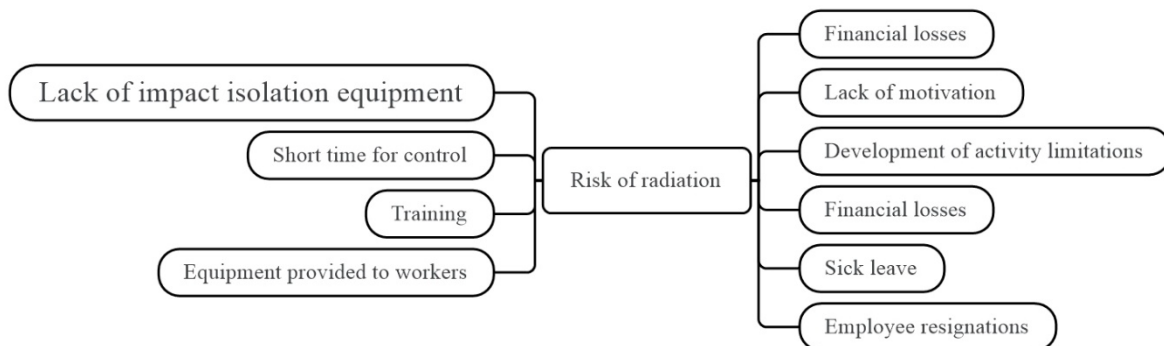


Figure 5. Risk of radiation, associated hazards and identified consequences

Figure 6 presents the risk of falling from vehicles, associated hazards and identified consequences. Like the other risks, this risk has as a hazard the lack of equipment and other tangential elements. The consequences are important and must be addressed comprehensively.



Figure 6. Risk of falling from vehicles, associated hazards and identified consequences

Figure 7 shows the risk of cutting. This risk is a common one and can cause important consequences.

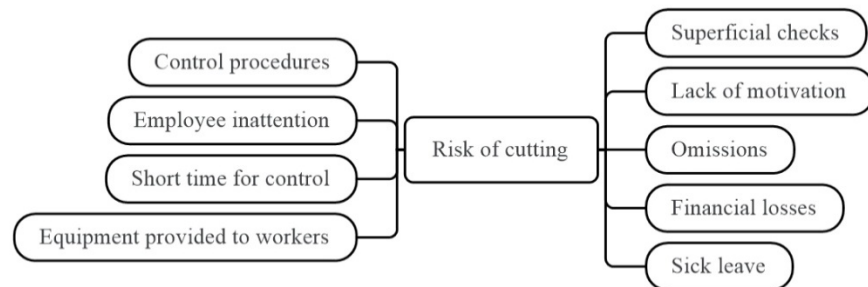


Figure 7. Risk of cutting associated hazards and identified consequences

Figures 8, 9, and 10 show the generation of bow-tie diagrams for the risks positioned in the red zone. For all these risks, preventive barriers and mitigate barriers are presented.

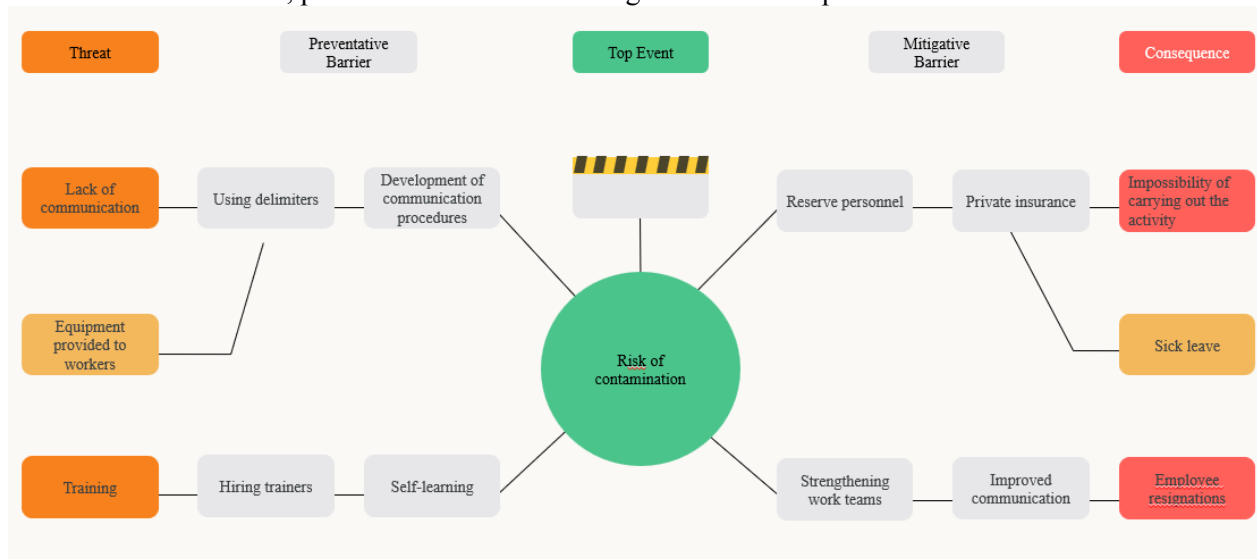


Figure 7. Bow tie for red risk, risk of contamination

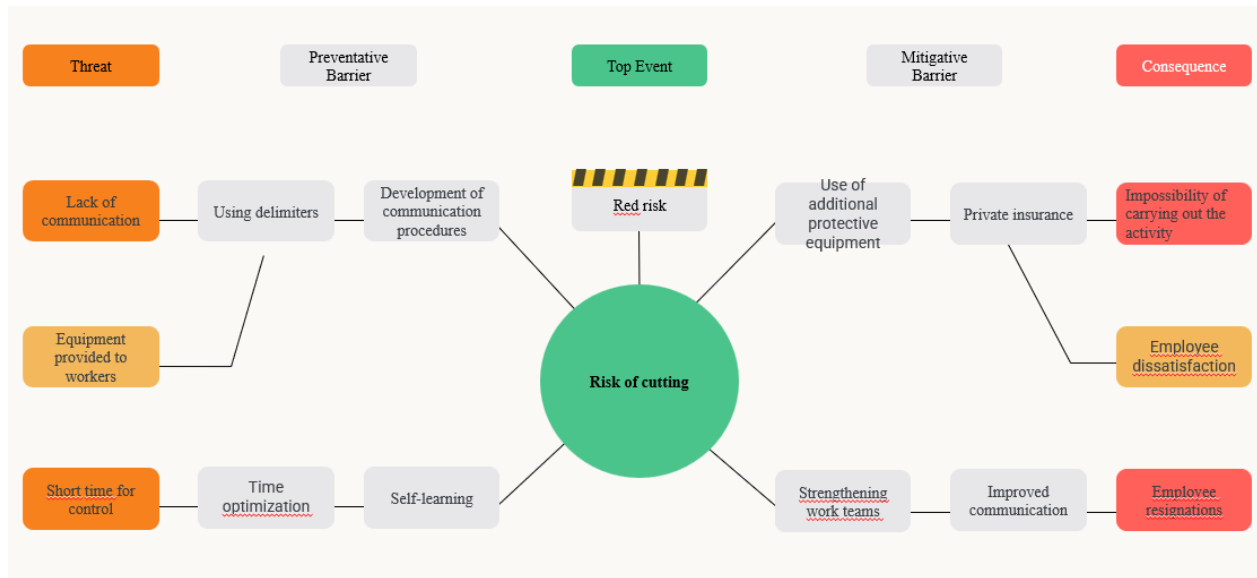


Figure 8. Bow tie for red risk, risk of cutting

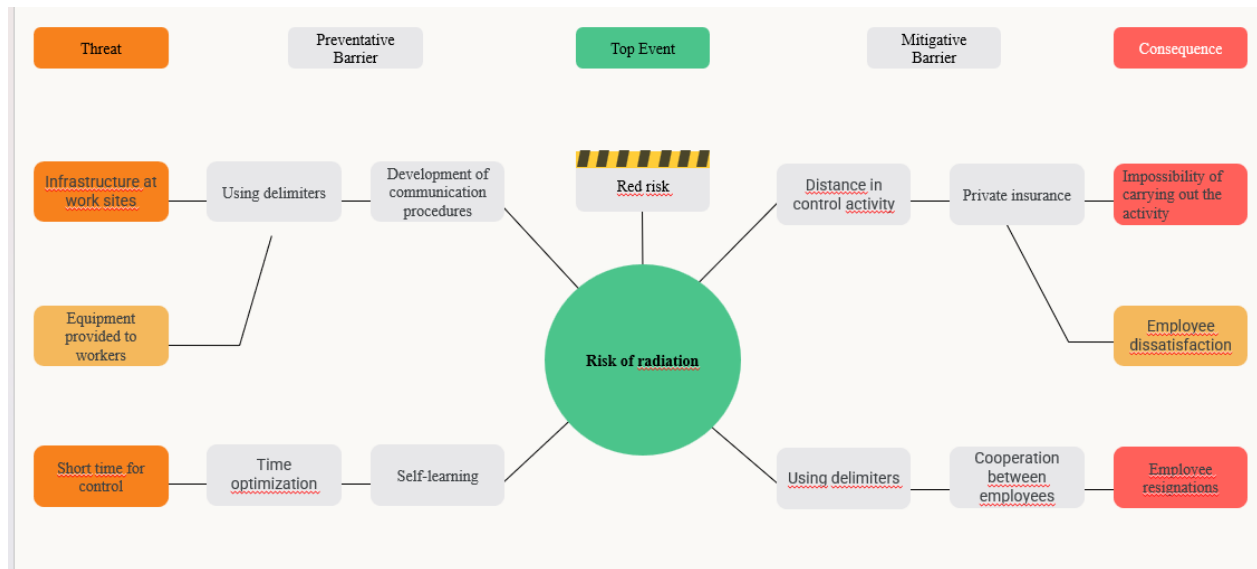


Figure 9. Bow tie for red risk, risk of radiation

Conclusion

Risk management in customs activity is very important and presents activities that are carried out by trained or specialized personnel. These risks must be monitored, and the risk register is an important tool.

The results obtained emphasize the importance of monitoring high-impact risks. The most important risks identified were risk of contamination, risk of radiation, and risk of cutting. These risks are located in the red area of the risk matrix. Bow-tie diagrams were simulated for these risks to help improve risk management decision-making. Other identified risks have a lower severity or a lower probability of occurrence.

The main limitations of the research used include:

- Data availability – some information on customs control strategies is classified and not publicly available.
- Generalizability of results – as customs risks differ from one country to another, the conclusions of the study may need to be adapted depending on the specific context of each state.
- Rapid evolution of fraud and smuggling methods – cross-border crime is constantly changing, which means that some of the strategies presented require constant updates.

References

- Alina, D. M., Miguel, F. L., Marian, N., Mihail, B., & Vanesa, V. M. (2021). The Challenges of the Higher Education Sector. The Impact of COVID-19 Crisis on the Educational Process—Case of Romania. *Springer Proceedings in Business and Economics*. https://doi.org/10.1007/978-3-030-86641-9_3
- Bhatta, D. D., Sarfraz, M., Ivascu, L., & Pislaru, M. (2023). The Nexus of Corporate Affinity for Technology and Firm Sustainable Performance in the Era of Digitalization: A Mediated Model. *Sustainability (Switzerland)*, 15(12). <https://doi.org/10.3390/su15129765>
- Borysenko, O., Vasylyeva, O., Katerna, O., Masiuk, I., & Panakhi, O. (2022). Modeling the Risks of the Global Customs Space. *Journal of Risk and Financial Management*, 15(12). <https://doi.org/10.3390/jrfm15120598>
- Cioca, L. I., Ivascu, L., Turi, A., Artene, A., & Gaman, G. A. (2019). Sustainable development model for the automotive industry. *Sustainability (Switzerland)*, 11(22). <https://doi.org/10.3390/su11226447>
- Dionne, G. (2013). Risk management: History, definition, and critique. *Risk Management and Insurance Review*. <https://doi.org/10.1111/rmir.12016>
- Fabbri, J. (2020). *Risk Scoring Methodology - RiskWatch*. Risk Watch.
- Fedotov, O., & Zotenko, O. (2020). Risk management in customs inspection of goods. *Lex Portus*, 3(23). <https://doi.org/10.26886/2524-101X.3.2020.5>
- Galaz, V., Centeno, M. A., Callahan, P. W., Causevic, A., Patterson, T., Brass, I., Baum, S., Farber, D., Fischer, J., Garcia, D., McPhearson, T., Jimenez, D., King, B., Larcey, P., & Levy, K. (2021). Artificial intelligence, systemic risks, and sustainability. *Technology in Society*, 67. <https://doi.org/10.1016/j.techsoc.2021.101741>
- Ivascu, L., & Cioca, L.-I. (2014). Opportunity risk: integrated approach to risk management for creating enterprise opportunities. *Advances in Education Research*.
- Medin, H. (2021). Customs brokers as intermediaries in international trade. *Review of World Economics*, 157(2). <https://doi.org/10.1007/s10290-020-00396-w>
- Pâslaru, M., Avasilcăi, S., & Trandabăt, A. (2008). Environmental sustainability based on fuzzy models. *Environmental Engineering and Management Journal*, 7(1). <https://doi.org/10.30638/eemj.2008.005>
- Pislaru, M., Alexa, L., & Avasilcăi, S. (2018). Assessment of project management implementation based on fuzzy logic approach. *Proceedings of the 31st International Business Information Management Association Conference, IBIMA 2018: Innovation Management and Education Excellence through Vision 2020*.
- Pislaru, M., & Trandabat, A. F. (2012). Fuzzy Based Environmental System Approach for Impact Assessment - Case Studies. *International Journal of Environmental and Ecological Engineering*, 6(7).
- Shubailat, O. M., Al-Zaqeba, M. A. A., Madi, A., & Ababneh, A. M. (2024). Customs intelligence and risk management in sustainable supply chain for general customs department logistics. *Uncertain Supply Chain Management*, 12(1). <https://doi.org/10.5267/j.uscm.2023.9.013>
- Sun, J., Sarfraz, M., Ivascu, L., Iqbal, K., & Mansoor, A. (2022). How Did Work-Related Depression, Anxiety, and Stress Hamper Healthcare Employee Performance during COVID-19? The Mediating Role of Job Burnout and Mental Health. *International Journal of Environmental Research and Public Health*, 19(16). <https://doi.org/10.3390/ijerph191610359>