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(EDITORS)

EUFIRE 2023

European
Financial Resilience
and Regulation

EDITURA UNIVERSITĂȚII „ALEXANDRU IOAN CUZA” DIN IAȘI

Mihaela Tofan • Irina Bilan • Elena Cigu

(editors)

European Financial Resilience and Regulation

EUFIRE 2023

“With the support of the Erasmus+ Programme of the European Union”



This project has been co-funded by the European Union. Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

This volume is the result of the Project ERASMUS-JMO-2022-HEI-TCH-RSCH EUFIRE-RE – 101085352, Jean Monnet Center of Excellence European Financial Resilience and Regulation EUFIRE-RE, supported by the Erasmus+ Programme of the European Union, and reunites a selection of the papers presented at the International Conference on "European Finance, Regulation and Business - EUFIRE 2023", organized at Alexandru Ioan Cuza University of Iasi, Faculty of Economics and Business Administration, in May 2023.

The papers published in Proceedings are exclusively engaging authors. The publisher and editors are not responsible for their content or for language proficiency.

Referenți științifici:

Prof. univ. dr. Simona Gherghina

Prof. univ. dr. Ovidiu Bunget

ISBN online: 978-606-714-784-1

© Editura Universității „Alexandru Ioan Cuza” din Iași, 2023

700109 – Iași, str. Munteni, nr. 34, tel./fax: (0232) 314947

<http://www.editura.uaic.ro> e-mail: editura@uaic.ro

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2023

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PUBLICITY (TRANSPARENCY) OF CROSS-BORDER INSOLVENCY PROCEEDINGS

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Abstract

The article insists on the legal solutions of the transparency of the cross-border insolvency. In this study, there were researched issues regarding the existing regulatory framework of the conditions of the cross-border insolvency publicity in the Republic of Moldova and the most important analysis being focused on the provisions of the European and international regulatory framework, which demonstrates a tendency to publish the information on the insolvency procedure, in particular those with international character. The convention of the Nordic states also includes provisions regarding the publicity of bankruptcy proceedings in the contracting states where the debtor owns assets, the disposition of insurance measures, legal assistance and the recognition of judgments between the contracting states. The publicity of the procedures in a sensitive matter subject to the internal legal framework, however at the international level this subject is not a very widespread since it involves additional time and additional costs as well as confidential issues of the parties (foreigners). The author finally comes with conclusions that can be implemented in both international and national regulations regarding transparency and publicity of the procedures in the insolvency process which comes out to be difficult and involved international issues and problems.

Keywords: *publicity; insolvency procedures; cross-border insolvency; jurisdiction; European case-law; harmonisation; cross-border business relations.*

JEL Classification: K33.

1. INTRODUCTION

Transparency in the realm of cross-border insolvency proceedings continues to hold a pivotal position within the context of today's intricately interconnected global economy. The escalating complexity of international financial transactions and the deep-rooted interdependence of businesses across geographical borders underscore the paramount significance of transparency throughout the insolvency process. This article analyzes profoundly into the legal measures aimed at elevating transparency in cross-border insolvency cases, with a focused lens on the Republic of Moldova. Through an exhaustive analysis of the prevailing regulatory framework and juxtapositions with international benchmarks, the

article accentuates the hurdles and potential solutions associated with advancing transparency within this intricate landscape.

2. CROSS-BORDER INSOLVENCY PROCEEDINGS

2.1. Principles governing cross-border insolvency proceedings

The bedrock of principles that govern cross-border insolvency proceedings, as identified by Bork, encompasses efficiency, transparency, predictability, and procedural justice. These principles stand as guiding lights for crafting insolvency protocols that not only incorporate these tenets but also adhere to them meticulously. However, it's noteworthy that within decentralized enterprise groups, the costs incurred during the negotiation and implementation of insolvency protocols might occasionally overshadow their potential benefits. Despite this, the adoption of such protocols is unlikely to compromise procedural justice or infringe upon the right to a fair trial. In fact, these protocols commonly amplify participation rights and meticulously outline notification prerequisites, reinforcing the interconnected nature of procedural justice and transparency (Bork, 2018, p. 7).

2.2. Efficiency and the role of insolvency protocols

Scrutinizing the efficacy of insolvency protocols within decentralized enterprise groups unveils a critical facet: the careful cost-benefit assessment of negotiation and execution. While the advantages of embracing an insolvency protocol are discernible, the expenses entailed by these endeavors might, in certain instances, surpass their advantages. It remains imperative to meticulously evaluate the specifics of each scenario, meticulously weighing the potential gains against the intricacies and costs. Such a nuanced evaluation serves as a compass for bolstering decision-making mechanisms within the realm of international insolvency (Bork, 2018, p. 6).

2.3. Procedural justice and implications for fair trials

Frequently, apprehensions arise regarding the possible repercussions of insolvency protocols on procedural justice and the right to a fair trial. In contrast to these concerns, protocols often weave provisions that not only amplify participation rights but also meticulously delineate stringent notification prerequisites. These provisions, far from diluting procedural justice, are structured to engender a more inclusive and transparent process, thereby aligning seamlessly with the bedrock principles of fairness. Consequently, the adoption of insolvency protocols generally serves as a catalyst for nurturing procedural justice instead of eroding it. It's unmistakably evident that these protocols are tailored to erect a structured and impartial framework for cross-border insolvency proceedings (Spark Legal Network, 2022).

2.4. Transparency as the cornerstone

The edifice of effective cross-border insolvency management is unequivocally founded on transparency (Wittle and McCourtie 2019, p. 32). The triumphant negotiation and embrace of an insolvency protocol hinge upon the vibrant involvement of stakeholders. The unequivocal exchange of information amongst concerned parties, especially within a decentralized context, emerges as a linchpin for informed judgments. Moreover, lucid channels of communication between courts emerge as pivotal components in sustaining transparency throughout the proceedings. Through such transparency, trust is nurtured, and the terrain is steered clear of potential conflicts or misinterpretations (Spark Legal Network, 2022).

2.5. Challenges and resolutions in information exchange

The intricacies of information exchange are navigated by the protocols in a nuanced manner. While the exchange of non-public information is indispensable for informed decision-making, limitations might materialize owing to concerns regarding confidentiality or conflicts of interest. Addressing these challenges necessitates a judicious calibration of information sharing, ensuring that a fine balance is struck between transparency and the safeguarding of sensitive data (Spark Legal Network, 2022).

2.6. Harmonization with national laws and jurisdictional norms

Central to the essence of insolvency protocols is their seamless alignment with national laws, jurisdictional norms, and pertinent legal frameworks. While these protocols pivot towards an international approach to insolvency proceedings, their harmonious integration with the distinct legal milieus of the concerned jurisdictions is of paramount importance (Kokorin and Wessels, 2021, p. 316). This harmonization not only fosters consistency and predictability but also underscores the overarching principles of equity in the application of protocols across geographical boundaries (Kokorin and Wessels, 2021, p. 317).

In a nutshell, Bork's bedrock principles of efficiency, transparency, predictability, and procedural justice manifest as a sturdy cornerstone for erecting potent cross-border insolvency protocols. While these protocols remain subject to an intricate cost-benefit analysis, their cardinal role lies in ameliorating procedural justice, transparency, and active participation. (Kokorin and Wessels, 2021, p. 317). The intricate interplay between these principles and their intricate intermingling with challenges such as information exchange and conformity with national laws and regulations crystallizes the intricate tapestry of cross-border insolvency. By intricately aligning insolvency protocols with these principles and adroitly tackling associated challenges, the panorama of international insolvency proceedings evolves into a more level, transparent, and efficient mechanism for steering the complexities of cross-border financial turmoil (Kokorin and Wessels, 2021, p. 317).

2.7. Legal avenues for transparency in cross-border insolvency

Throughout the trajectory of this academic inquiry, the spotlight has been firmly fixed on investigating the regulatory scaffolding that underpins transparency in cross-border insolvency within the precincts of the Republic of Moldova. However, the panorama of promoting transparency transcends national frontiers due to the inherent essence of cross-border insolvency cases.

2.8. Comparative scrutiny of global regulatory frameworks

A significant facet of this exploration has entailed an exhaustive dissection of the tenets enshrined within both the European and global regulatory frameworks. The trajectory of global evolution showcases a discernible drift towards augmenting transparency by divulging information pertinent to insolvency procedures, particularly those interlaced with an international dimension. This evolution unfurls prominently within the edicts of the European Union's insolvency regulations, where the clarion call is for openness and lucidity within cross-border insolvency cases. Furthermore, the convention upheld by Nordic states equally weaves clauses pertaining to the publicity of bankruptcy proceedings within the contracting states (Hallak, 2023).

2.9. Balancing the dichotomy of confidentiality and transparency

The juxtaposition of transparency and the confidential nature of certain proceedings often unfurls a nuanced duality (Chan Ho, 2016, p. 48). While transparency stands as the vanguard for ensuring fairness, accountability, and efficient resolution within cross-border insolvency cases, its trajectory invariably intersects with the confidential underpinnings of certain procedures. Nationally, concerns might germinate due to the delicacy of the matter, potentially triggering conflicts between transparency and confidentiality. However, it's imperative to underscore that on an international spectrum, the growing emphasis on transparency finds resonance due to its pivotal role in cultivating trust among an array of stakeholders (Chan Ho, 2016, p. 48).

2.10. Challenges in perspective and culmination

The labyrinthine labyrinth of cross-border insolvency cases introduces an array of challenges to the seamless integration of comprehensive transparency. These tribulations span additional temporal and financial investments, concerns pertaining to confidentiality, and the intricacies of steering international legal nuances. Despite these obstacles, the inquiry culminates in a resolute assertion that propelling transparency is not only viable but quintessential for upholding an equitable and effective cross-border insolvency regime.

2.11. Recommendations for pragmatic implementation

The elucidation advanced within this discourse propounds that the principles of transparency can be actualized within both international and national regulatory frameworks. This translation mandates a judicious equilibrium between the yearning for openness and the safeguarding of confidential information. To tackle this, jurisdictions such as the Republic of Moldova and its counterparts can contemplate embracing measures that seamlessly ensconce transparency while safeguarding the interests of the entities embroiled. Such measures might encompass the formulation of guidelines for the dissemination of pertinent information, the delineation of protocols for managing classified data, and the fostering of international cooperation within insolvency cases (Boone, 2012, p. 45).

3. CONCLUSIONS

To culminate, the clarion call for transparency within the intricate tapestry of cross-border insolvency proceedings resounds with an unwavering resonance, transcending the delineations of national frontiers. The odyssey through the corridors of legal thought and pragmatic solutions, embarked upon within the course of this intellectual voyage, illuminates a profound shift in the global compass—a resolute trajectory oriented toward nurturing openness and crystalline clarity within insolvency proceedings that bear the indelible mark of international implications.

As one navigates through the labyrinthine pathways of these complex procedures, it's undeniable that lingering challenges linger like shadows, casting occasional doubts on the feasibility of this pursuit. However, the dividends that transparency yields are both compelling and consequential. They stretch far beyond mere ideals, unfurling as tangible manifestations that reverberate across the landscape of cross-border insolvency. Enhanced trust becomes a foundational cornerstone, anchoring the interactions between stakeholders across geographical divides. In this arena of multifaceted complexity, the prism of transparency refracts rays of efficient resolutions, untangling the intricacies that might otherwise mire the process.

Notably, the value of transparency is underscored by its role in leveling the terrain, paving the way for a truly equitable field for all stakeholders involved. Within these meticulously constructed protocols, the intricacies of power dynamics and geographical disparities dissolve as transparency plays the role of a great equalizer. It ensures that no party is left in the shadows, that every voice finds resonance in the symphony of proceedings, and that a harmonious accord is struck between interests that might have otherwise seemed discordant.

The Republic of Moldova, standing at the crossroads of its own legal evolution, holds the potential to become an active contributor to this burgeoning global movement. Its synergy with global counterparts is poised to facilitate a synchronized dance toward a future steeped in transparency. This endeavor,

however, is no mere Utopian aspiration; it necessitates pragmatic strategies and meticulous blueprints. The envisioned legal avenues must not only delicately balance the twin facets of transparency and confidentiality but also be adaptable to the nuanced peculiarities that cross-border scenarios bring to the fore.

Through the adoption of these well-conceived measures, the contours of the insolvency process hold the promise of a transformative metamorphosis. What was once a labyrinth of uncertainty becomes a paragon of equity and accountability. The insolvency process itself transcends its former dimensions, evolving into a mechanism that not only addresses financial distress but does so with a profound sense of fairness, responsibility, and a global perspective.

In our ever-shrinking world, where distances collapse and connections span continents in the blink of an eye, the significance of transparent cross-border insolvency proceedings reverberates with a resonance that transcends mere legalities. It embodies the spirit of collaboration, the embodiment of a shared understanding that the challenges we face are intertwined, as are the solutions we devise. Through transparency, the global community takes a resolute stride toward a more harmonious and just world - one where the complexities of financial turmoil are met with an unwavering commitment to fairness, and where accountability stands as the bedrock upon which the edifice of our interconnectedness is built.

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ANALYSIS OF THE HEALTHCARE SYSTEM IN ROMANIA FROM THE PERSPECTIVE OF PREPARING THE HOSPITAL MEDICAL INFRASTRUCTURE AND HUMAN RESOURCES FOR THE COVID-19 CRISIS

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Abstract

One of the most critical factors for the development and well-being of society is represented by the healthcare system, which has recently become a huge sector. The budget allocated by each country for healthcare expenditure varies according to their level of development, it covers a significant part of the total budget. The health system and its infrastructure are under enormous pressure due to the rising costs of providing healthcare, increasing demand for health services, demographic changes and social inequalities, but healthcare is a vital public service. The main task of modern healthcare is to improve lifestyle and quality of life by providing current medical services at affordable prices. The objective of this paper is to analyze the healthcare system from the perspective of preparing the hospital medical infrastructure and human resources for the Covid-19 crisis based on specific external public audit methods. The Covid-19 crisis has dealt a shock to health systems, testing the adaptability and resilience of their key features. Detailed projections of resource and funding requirements can contribute to better long-term planning and sustainability of healthcare systems. Indicating that although destabilized, a health system can absorb the impact of shocks, recover, adapt and learn from this experience.

Keywords: *public health; Covid-19 crisis; health infrastructure; economy.*

JEL Classification: I15, H5.

1. INTRODUCTION

The problems facing today's healthcare systems include an aging population, increased demand, new technology, rising healthcare expenditures, and an increase in the burden of chronic diseases (Džakula *et al.*, 2022). The effect of various health system variables on population health outcomes, based on prior work, is yet unknown. There is evidence that health finance affects health outcomes, according to earlier studies. Higher health expenditure may result in improved health outcomes since lower mortality and fewer years of life lost have been linked to higher overall healthcare spending (Vavken, 2012).

Due to the fact that it directly affects every individual, the evaluation of the effectiveness of the health systems is an area of intense debate among governments, international organizations, and the general public. Therefore, while creating growth goals and plans, the primary objective should be to increase efficiency in any area related to health. Technical efficiency, which involves creating more outputs than inputs, and allocative efficiency, which denotes the rational allocation of resources to produce the best results at the lowest costs, should both be taken into consideration when measuring health efficiency (OECD, 2016).

Studies that investigate the effectiveness of public health systems can be found in the literature, primarily at the microeconomic level, i.e., patients, hospitals, measures, and health programs (Hadad, Hadad and Simon-Tuval, 2013; Behr and Theune, 2017) as well as comparative research at the macro level, between states or regions (Cetin and Bahce, 2016; Ferraz *et al.*, 2021). However, the latter studies are much less common than the former. To determine the stimulants, or obstacles standing in the way of health systems, professionals must argue for efficiency in the healthcare industry. European nations differ in their health systems' effectiveness. The COVID-19 pandemic emergency has significantly altered a number of facets of life. The working environment has changed, and in addition to the old problems, there are now new ones. Countries must adapt to these conditions and devise (often unusual) answers to the issues they face. The effectiveness of the healthcare system in times of emergency directly affects people's lives, therefore the current crisis in some ways adds to that obligation (Lupu and Tiganasu, 2022). The COVID-19 outbreak has simply served as a further reminder of how fragile the health systems in Eastern European countries are (Lupu and Tiganasu, 2022).

The Romanian government implemented actions in a similar way to other nations that were impacted by the new coronavirus by adhering to WHO guidelines (CNSCBT, 2020). At various phases of epidemic containment, however, difficulties were encountered, including a significant number of people returning from abroad, a weak healthcare infrastructure, and sociocultural variables. In order to educate future tactics in the context of an ongoing pandemic, the study presents the accomplishments and pitfalls of the COVID-19 response in Romania. Parallels might be drawn to the chain of events that occurred in Romania in order to help handle future public health emergencies since there are significant lessons that can be gained from them.

The majority of medical services are offered in Romania through the public healthcare system, which still heavily depends on the antiquated infrastructure constructed during the previous communist dictatorship (Vladescu *et al.*, 2016). Romania also has the lowest health spending of any EU nation in terms of both per-capita spending (WHO, 2022) and the percentage of GDP.

Due to a lack of essential tools, substandard hospitals, and a shortage of resources, these flaws have previously created problems during prior epidemics and emergencies (Romanian Ministry of Internal Affairs, 2016; Dascalu, 2019). Due to the ongoing exodus of medical professionals, the Romanian healthcare sector also struggles with a lack of manpower. Since the nearest medical facilities are frequently located far away, many rural regions lack immediate access to healthcare facilities (Neagu, 2019). Together, these underlying problems made the challenges brought on by the COVID-19 outbreak worse.

According to the World Health Organization, the COVID-19 pandemic caused terrible social and economic disruption on a worldwide scale and was an unparalleled public health risk. An in-depth investigation of the causes of these variances is necessary since there have been significant discrepancies in the responses and performance of national healthcare systems in the face of the epidemic (Jakovljevic, 2022).

2. LITERATURE REVIEW

One of the most significant sectors of the economy has been health, and every government must prioritize life preservation. Growing concerns include the need to develop methods for managing both resources and people (Zamiela *et al.*, 2022).

The COVID-19 pandemic is the most significant worldwide health crisis since the influenza epidemic of 1918–1919. It brought with it previously unheard-of difficulties that put health systems' ability to withstand shocks to the test, eventually demonstrating that the world was not ready to handle such catastrophes. As a result, it becomes necessary to consider if, two and a half years after the COVID-19 pandemic's initial effects, there is anything new we should be considering in order to update our understanding of the idea of health system resilience, its phases, analytical framework, and implementation methods (Catussi Paschoalotto *et al.*, 2023).

As a result of the COVID-19 pandemic, health systems all around the world have experienced severe shocks; as a result, there is growing focus on the resilience of health systems and research into ways to survive shocks.

The health system, public health, and society are all under a great deal of stress as a result of COVID-19 (WHO, 2020). Four distinct challenges have resulted from the pandemic's shock: an increased burden of disease and mortality (CDC, 2021), a severe toll on mental health and wellbeing (Vindegaard and Benros, 2020), delays in necessary and urgent non-COVID-19 care (The Lancet Rheumatology, 2021), and acute economic losses (Evans and Over, 2020), not least because of widespread unemployment and other social health determinants (Abrams and Szeffler, 2020). Such forces significantly destabilize supply and demand in the health system when brought on by abrupt and intense change or

shock, which increases need while eroding capacity for treatment (Thomas *et al.*, 2020).

Health system resilience can be defined as a system's ability to withstand shocks over the course of its lifecycle in four phases: readiness, onset detection and quick response, impact management to maintain access and quality to the health system, and post-impact management of legacy issues (Thomas *et al.*, 2020). The term "health system resilience" has emerged as an adaptive approach to analyzing the impact of various types of crises, including economic recessions (Thomas *et al.*, 2013), Ebola epidemics (Kruk *et al.*, 2015; Ling *et al.*, 2017), refugee influxes (Ammar *et al.*, 2016; Alameddine *et al.*, 2019), and infectious disease outbreaks (Nuzzo *et al.*, 2019).

Health systems must be able to provide high-quality individual care while resolving broader social health issues. They must not only adjust to unexpected shocks and drastic shifts but also to expect, long-term challenges brought on by an aging population and rising multimorbidity (Corbaz-Kurth *et al.*, 2022).

According to Stephenson (2010), Barasa *et al.* (2017), and Nuzzo *et al.* (2019), resilient healthcare refers to the processes and capabilities that a complex healthcare system is able to manage to help it recover from common contingencies and rare but larger-scale hazards and provide quality care while addressing deeper issues.

Health systems all across the globe have been challenged by the coronavirus epidemic. Any government activity to comprehend, adapt, and react to the changes the epidemic has imposed depends on regional will, talents, and resources (Wiig and O'Hara, 2021). The effects of effective programs and initiatives started by a centralized government have been strongly related to decentralized activities taken by members of the public, leaders in the field of health, and healthcare professionals across the board. The idea of resilience in healthcare is consistent with the dual collaboration required from both centralized and decentralized systems (Hollnagel, 2018; Øyri and Wiig, 2022).

3. METHODOLOGY

Research on the health system's analysis from the perspective of preparing hospital medical infrastructure and human resources for the Covid-19 issue has been conducted.

3.1. Study area

Romania is represented in the research region by its 42 counties as can be seen in Figure 1 (Bacău, Botoșani, Iași, Neamț, Suceava and Vaslui part of North-East Development Region; Brăila, Buzău, Constanța, Galați, Vrancea and Tulcea part of South-East Development Region; Argeș, Călărași, Dâmbovița, Giurgiu, Ialomița, Prahova and Teleorman part of South-Muntenia Development Region; Dolj, Gorj, Mehedinți, Olt and Valcea part of South-West Oltenia Development

The data has 336 observations, from 42 units. The dependent variable *complaints* have a mean of 16, and a standard deviation of 25, while the dependent variable of interest *expenditures* has a mean of 523325. Due to the high difference in values, it was decided to use logarithmic values, also to normalize the series. In this case,

The correlation matrix is presented in Table 2.

Table 2. Correlation matrix

	complaints	nosocomial	medics	nurses	beds	logEXP
complaints	1.0000					
nosocomial	0.6966	1.0000				
medics	0.5941	0.1883	1.0000			
nurses	0.6151	0.1965	0.9872	1.0000		
beds	0.5830	0.1711	0.9856	0.9881	1.0000	
logEXP	0.4394	0.1243	0.1372	0.1725	0.1619	1.0000

Source: computed by author using database of the National Institute of Statistics (2023)

The correlation matrix suggests a high correspondence between *complaints* and *nosocomial*, and also between *complaints*, *number of medics*, *nurses* and *beds*. There is also relatively high correlation between complaints and expenditures (in logarithmic value), a fact that can be explained as follows: the number of complaints depending directly on the medical act, which is regarded as a single variable depends on financing/expenditures. On the other hand, there is no direct implication of financing on diagnostics, or the nursing activity. In this case, the expenditures become an important variable of interest along with *nosocomial*, *between the number of medics, nurses or beds*. Due to the high correlation between the number of medics, nurses and beds, the variables will be used as control and will be interchangeable.

The choice of the methodology (Tables 3-9) is related to the fact that there are particularities in hospitals, and changes between years, so the fixed and random effects on panel data will be used. After performing these models, a Hausman test will be used to disguise between fixed and random effects.

Table 3. Panel Data statistics

Variable		Mean	Std. Dev.	Min.	Max.	Obs.
year	overall	2017.5	2.29471	2014	2021	N = 336
	between		0	2017.5	2017.5	n = 42
	within		2.29471	2014	2021	T = 8
beds	overall	2938.723	2967.61	695	20198	N = 336
	between		2996.595	701.375	19898.63	n = 42
	within		121.4957	1763.098	4086.723	T = 8
medics	overall	345.5	479.2345	61	3412	N = 336
	between		482.8019	69.625	3136.375	n = 42

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Variable		Mean	Std. Dev.	Min.	Max.	Obs.
<i>nurses</i>	within		37.93032	54.125	621.125	T = 8
	overall	1129.321	1239.875	186	8900	N = 336
	between		1247.396	222.25	8129	n = 42
<i>nosocomial</i>	within		117.5095	458.3214	1900.321	T = 8
	overall	0.56477	1.90779	0	32.6053	N = 336
	between		0.76616	0.00839	4.32635	n = 42
<i>complaints</i>	within		1.75069	-3.66948	28.84372	T = 8
	overall	16.49405	25.26705	0	210	N = 336
	between		22.60893	0	109	n = 42
<i>revenue</i>	within		11.74483	-36.50595	117.494	T = 8
	overall	526954.3	903861.9	61743	8193665	N = 336
	between		851378.7	114319.5	5520782	n = 42
<i>expenditures</i>	within		327516	-1612206	3199837	T = 8
	overall	523325.6	906063.1	58093	8144052	N = 336
	between		855418.6	113214.6	5561922	n = 42
<i>County</i>	within		323263.8	-1731343	3105455	T = 8
	overall	21.5	12.139	1	42	N = 336
	between		12.26784	1	42	n = 42
<i>logEXP</i>	within		0	21.5	21.5	T = 8
	overall	12.67761	0.85401	10.9698	15.9128	N = 336
	between		0.76577	11.53822	15.48165	n = 42
<i>logREV</i>	within		0.39392	12.01986	13.3738	T = 8
	overall	12.68827	0.85269	11.03074	15.91887	N = 336
	between		0.76652	11.55242	15.47374	n = 42
	within		0.38961	11.97214	13.37683	T = 8

Source: computed by the author using database of the National Institute of Statistics (2023)

Table 4. Variance inflation factor for: "complaints", "nosocomial", "medics", "nurses", "beds" and "logEXP"

Variable	VIF	1/VIF
<i>nurses</i>	64.62	0.01548
<i>beds</i>	52.73	0.01896
<i>medics</i>	50.94	0.01963
<i>logEXP</i>	2.68	0.37354
<i>nosocomial</i>	1.07	0.93653
<i>Mean VIF</i>	34.41	

Source: computed by the author

Table 5. Variance inflation factor for: "complaints", "nosocomial", "beds" and "logEXP"

Variable	VIF	1/VIF
<i>logEXP</i>	4.85	0.20626
<i>nosocomial</i>	1.07	0.9338
<i>beds</i>	3.91	0.25554
<i>year</i>		
<i>2015</i>	1.77	0.56492
<i>2016</i>	1.79	0.55777
<i>2017</i>	1.91	0.52326
<i>2018</i>	2.11	0.47289
<i>2019</i>	2.3	0.43393
<i>2020</i>	2.44	0.40944
<i>2021</i>	2.57	0.38836
<i>Mean VIF</i>	2.47	

Source: computed by the author

Table 6. Full results for fixed and random effects models (including time effects)

	(1) Model: Fixed Effects Dependent variable: complaints	(2) Model: Fixed Effects Dependent variable: complaints	(3) Model: Fixed Effects Dependent variable: complaints	(4) Model: Random Effects Dependent variable: complaints	(5) Model: Random Effects Dependent variable: complaints	(6) Model: Random Effects Dependent variable: complaints
<i>VARIABLES</i>						
<i>logEXP</i>	-40.44* (23.08)	-47.18* (24.79)	-40.66** (19.93)	-7.066 (6.874)	-13.20 (9.884)	-21.01* (12.64)
<i>nosocomial</i>	0.434* (0.710)	0.443* (0.765)	0.187* (0.459)	0.755* (1.047)	0.614* (0.871)	0.386* (0.637)
<i>beds</i>	-0.0268 (0.0174)			0.00552*** (0.00131)		
<i>medics</i>		0.0709* (0.0462)			0.0492*** (0.0130)	
<i>nurses</i>			0.0382* (0.0216)			0.0247*** (0.00639)
<i>2015.year</i>	3.649** (1.652)	5.517** (2.666)	3.155* (1.678)	2.463* (1.368)	3.238* (1.711)	2.379* (1.443)
<i>2016.year</i>	9.792** (4.369)	12.18** (5.532)	8.463** (3.896)	3.853** (1.672)	5.150** (2.569)	5.178** (2.195)
<i>2017.year</i>	19.41* (9.631)	23.19** (11.29)	16.96** (7.797)	5.326* (3.020)	7.815 (5.216)	9.243* (5.186)
<i>2018.year</i>	33.74** (16.20)	38.18** (17.67)	30.35** (13.52)	11.12*** (4.049)	14.61** (7.126)	18.03** (7.700)
<i>2019.year</i>	39.83* (20.04)	44.66** (21.55)	35.86** (16.16)	11.74** (5.813)	15.69* (9.502)	20.52* (10.86)
<i>2020.year</i>	42.35* (21.97)	47.43** (23.44)	37.01** (17.65)	11.34* (6.134)	15.38 (10.07)	20.37* (11.35)
<i>2021.year</i>	50.47** (24.73)	55.90** (27.04)	44.67** (20.22)	16.91** (7.840)	21.05* (12.62)	26.59* (14.14)
<i>Constant</i>	582.8*	561.5*	466.7*	81.58	156.1	242.0

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	(1)	(2)	(3)	(4)	(5)	(6)
	Model: Fixed Effects Dependent variable: complaints	Model: Fixed Effects Dependent variable: complaints	Model: Fixed Effects Dependent variable: complaints	Model: Random Effects Dependent variable: complaints	Model: Random Effects Dependent variable: complaints	Model: Random Effects Dependent variable: complaints
<i>Obs.</i>	(310.9)	(294.7)	(239.5)	(82.34)	(115.7)	(147.1)
<i>R-squared</i>	0.186	0.151	0.21	336	336	336
<i>Counties</i>	42	42	42	42	42	42
<i>Unit effects</i>	YES	YES	YES	YES	YES	YES
<i>Time effects</i>	YES	YES	YES	YES	YES	YES
<i>Robust</i>	YES	YES	YES	YES	YES	YES

Source: computed by author

Table 7. Full Results for Fixed and Random Effects Models with Lag Instrumented dependent variable (including time effects)

	(1)	(2)	(3)	(4)	(5)	(6)
	Model: Fixed Effects with Instrumented variables Dependent variable: complaints	Model: Fixed Effects with Instrumented variables Dependent variable: complaints	Model: Fixed Effects with Instrumented variables Dependent variable: complaints	Model: Random Effects with Instrumented variables Dependent variable: complaints	Model: Random Effects with Instrumented variables Dependent variable: complaints	Model: Random Effects with Instrumented variables Dependent variable: complaints
<i>VARIABLES</i>						
<i>L.complaints</i>	0.0665 (0.607)	1.623 (2.743)	6.589 (23.25)	0.318 (0.207)	0.338* (0.205)	0.309 (0.208)
<i>L2.complaints</i>	0.256** (0.0995)	0.561 (0.350)	0.996 (2.282)	0.584*** (0.165)	0.571*** (0.164)	0.579*** (0.164)
<i>logEXP</i>	-23.12* (27.73)	-37.15* (114.4)	-30.8* (948.9)	-6.139*** (2.115)	-4.002** (1.811)	-5.893*** (2.030)
<i>nosocomial</i>	3.414 (2.982)	10.01 (11.05)	26.81 (83.64)	2.121 (1.381)	2.270 (1.402)	1.693 (1.398)
<i>beds</i>	-0.0234*** (0.00903)			0.00319*** (0.000740)		
<i>2018.year</i>	9.467 (6.879)	25.06 (25.19)	69.21 (205.1)	5.215** (2.504)	4.510* (2.498)	5.072** (2.492)
<i>2019.year</i>	12.44 (13.20)	46.50 (53.51)	143.5 (449.8)	4.498 (2.754)	3.160 (2.653)	4.217 (2.713)
<i>2020.year</i>	10.69 (14.38)	45.38 (55.26)	141.6 (450.2)	0.961 (2.891)	-0.795 (2.796)	0.500 (2.832)
<i>2021.year</i>	17.65 (16.49)	57.72 (63.21)	167.0 (512.7)	7.031** (2.956)	4.943* (2.830)	6.334** (2.872)
<i>medics</i>		0.0803 (0.127)			0.0160*** (0.00385)	
<i>nurses</i>			0.145 (0.458)			0.00754*** (0.00170)
<i>Constant</i>	368.5 (370.8)	1,224 (1,437)	3,728 (11,730)	68.73*** (25.23)	45.68** (22.08)	66.88*** (24.43)
<i>Observations</i>	210	210	210	210	210	210

	(1)	(2)	(3)	(4)	(5)	(6)
	Model: Fixed Effects with Instrumented variables	Model: Fixed Effects with Instrumented variables	Model: Fixed Effects with Instrumented variables	Model: Random Effects with Instrumented variables	Model: Random Effects with Instrumented variables	Model: Random Effects with Instrumented variables
	Dependent variable: complaints	Dependent variable: complaints	Dependent variable: complaints	Dependent variable: complaints	Dependent variable: complaints	Dependent variable: complaints
<i>Number of County</i>	42	42	42	42	42	42
<i>Unit effects</i>	YES	YES	YES	YES	YES	YES
<i>Country</i>						
<i>Time effects</i>	YES	YES	YES	YES	YES	YES
<i>Year</i>						
<i>Robust</i>	YES	YES	YES	YES	YES	YES
<i>Instrumented</i>	YES	YES	YES	YES	YES	YES

Source: computed by the author

The objective is the estimation in (1) the main content of β (estimates, coefficient vector), considering the existence of a unit-specific error-term v_i , that differs between units, but is constant for any particular one, y_{it} is the dependent variable, \mathbf{x}_{it} is the dependent variables matrix, and ϵ_{it} is the error term.

$$y_{it} = \alpha + \mathbf{x}_{it}\beta + v_i + \epsilon_{it} \quad (1)$$

The previous equation can be rewritten as in (2):

$$\bar{y}_i = \alpha + \mathbf{x}_i\beta + v_i + \bar{\epsilon}_i \quad (2)$$

where the content is calculated as follows:

$$\bar{y}_i = \sum_t y_{it}/T_i$$

$$\mathbf{x}_i = \sum_t \mathbf{x}_{it}/T_i$$

$$\bar{\epsilon}_i = \sum_t \epsilon_{it}/T_i$$

Subtracting (2) from (1), it results that (3):

$$(y_{it} - \bar{y}_i) = (\mathbf{x}_{it} - \mathbf{x}_i)\beta + (\epsilon_{it} - \bar{\epsilon}_i) \quad (3)$$

These equations (1) – (3) are the basics for calculating fixed effects models. For the random effects model, the equation is in (4), see Stata manual for further information, <https://www.stata.com/manuals13/xtxtivreg.pdf>:

$$(y_{it} - \theta \bar{y}_i) = (1 - \theta)\alpha + (x_{it} - \theta \bar{x}_i)\beta + \{(1 - \theta)v_i + (\epsilon_{it} - \theta \bar{\epsilon}_i)\} \quad (4)$$

Further, we consider that the dependent variable can be lagged and there are some endogenous relations between independent variables, so the equation for the second set of models is (5):

$$y_{it} = Y_{it}\gamma + X_{1it}\beta + \mu_i + v_{it} = Z_{it}\delta + \mu_i + v_{it} \quad (5)$$

Where: y_{it} is the dependent variable, X_{1it} is a vector of observations on the exogenous variables included as covariates, δ, γ, β are the vectors of coefficients and $Z_{it} = [Y_{it} X_{1it}]$ (as in Stata manual, <https://www.stata.com/manuals13/xtxtivreg.pdf>).

The results are presented in the following section.

4. RESULTS AND DISCUSSIONS

A naive attempt of OLS modelling on "complaints", "nosocomial", "medics", "nurses", "beds" and "logEXP" suggests a high VIF variance inflation factor, which can be explained by the high value of correlations between the implied variables. In this case, we will use the variables "medics", "nurses", "beds" as control interchangeable variables.

The main interest is in the effect of expenditures and nosocomial infections on the complaints, using as control medical variables (beds, medics, and nurses). We control for county particularities (every county has different financing, the medical skills differ and so on), for time changes (it consider time effect - the conditions in activity changes, see for example the COVID-19 effects), and we use option robust to control for the presence of heteroskedasticity.

The results are available in Table 8.

Table 8. Fixed and Random Effects Models

	(1)	(2)	(3)	(4)	(5)	(6)
	Model: Fixed Effects Dependent variable: complaints	Model: Fixed Effects Dependent variable: complaints	Model: Fixed Effects Dependent variable: complaints	Model: Random Effects Dependent variable: complaints	Model: Random Effects Dependent variable: complaints	Model: Random Effects Dependent variable: complaints
VARIABLES						
<i>logEXP</i>	-40.44* (23.08)	-47.18* (24.79)	-40.66** (19.93)	-7.066 (6.874)	-13.20 (9.884)	-21.01* (12.64)
<i>nosocomial</i>	0.434* (0.710)	0.443* (0.765)	0.187* (0.459)	0.755* (1.047)	0.614* (0.871)	0.386* (0.637)
<i>beds</i>	-0.0268 (0.0174)			0.00552*** (0.00131)		

	(1)	(2)	(3)	(4)	(5)	(6)
	Model: Fixed Effects	Model: Fixed Effects	Model: Fixed Effects	Model: Random Effects	Model: Random Effects	Model: Random Effects
	Dependent variable:	Dependent variable:	Dependent variable:	Dependent variable:	Dependent variable:	Dependent variable:
	complaints	complaints	complaints	complaints	complaints	complaints
<i>medics</i>		0.0709* (0.0462)			0.0492*** (0.0130)	
<i>nurses</i>			0.0382* (0.0216)			0.0247*** (0.00639)
<i>Constant</i>	582.8* (310.9)	561.5* (294.7)	466.7* (239.5)	81.58 (82.34)	156.1 (115.7)	242.0 (147.1)
<i>Obs.</i>	336	336	336	336	336	336
<i>R-squared</i>	0.186	0.151	0.21			
<i>Counties</i>	42	42	42	42	42	42
<i>Unit effects</i>	YES	YES	YES	YES	YES	YES
<i>Time effects</i>	YES	YES	YES	YES	YES	YES
<i>Robust</i>	YES	YES	YES	YES	YES	YES

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Source: author's own calculations

The results suggest that the impact of the financing in hospitals (expenditures in logarithmic value) is negative and statistically significant in all models, as expected. The Hausman tests (available on demand) suggest that the fixed effects model should be considered. In the first case, when the control variable is number of *beds*, an increase with 10% in *expenditures* (logEXP) decreases the dependent variable with approximately 4 (3,8) complaints ($40 \cdot \log(1,1)$), keeping other variables constant, *ceteris paribus*. The increase with 100 units (beds) reduces the number of complaints with 3 complaints (2,68), while an increase with 10 *nosocomial* infections increases the complaints by 4. For the control variable *medics*, the impact of *hospital expenditures* is evaluated at reducing the complaints by 5 (4.49), while using the *nurses*, the quantified negative effect is 4 (3,90). The conclusion is that the dimension of public expenditure has an important role in reducing the number of complaints in hospitals, as expected. The *nosocomial* variable has a positive impact on complaints (negative relative to medical services provided).

Other attempts to further analyses are considering the possibility of the influence of the previous complaints on actual ones. In this case, controlling for the fixed and time effects is not sufficient. The third lag is used (13.complaints) as an instrumental variable for *l.complaints* (first lag). Being instrumented, the possible endogeneity is controlled. The results are available in Table 9 and Table 7 in the section methodology.

Table 9. The third lag is used (l3.complaints) as an instrumental variable for l.complaints (first lag)

	(1)	(2)	(3)	(4)	(5)	(6)
	Model:Fixed Effects with Instrumented variables	Model:Fixed Effects with Instrumented variables	Model:Fixed Effects with Instrumented variables	Model:Random Effects with Instrumented variables	Model:Random Effects with Instrumented variables	Model:Random Effects with Instrumented variables
	Dependent variable: complaints	Dependent variable: complaints	Dependent variable: complaints	Dependent variable: complaints	Dependent variable: complaints	Dependent variable: complaints
VARIABLES						
<i>L.complaints</i>	0.0665 (0.607)	1.623 (2.743)	6.589 (23.25)	0.318 (0.207)	0.338* (0.205)	0.309 (0.208)
<i>L2.complaints</i>	0.256** (0.0995)	0.561 (0.350)	0.996 (2.282)	0.584*** (0.165)	0.571*** (0.164)	0.579*** (0.164)
<i>logEXP</i>	-23.12* (27.73)	-37.15* (114.4)	-30.8* (948.9)	-6.139*** (2.115)	-4.002** (1.811)	-5.893*** (2.030)
<i>nosocomial</i>	3.414 (2.982)	10.01 (11.05)	26.81 (83.64)	2.121 (1.381)	2.270 (1.402)	1.693 (1.398)
<i>beds</i>	-0.0234*** (0.00903)			0.00319*** (0.000740)		
<i>medics</i>		0.0803 (0.127)			0.0160*** (0.00385)	
<i>nurses</i>			0.145 (0.458)			0.00754*** (0.00170)
<i>Constant</i>	368.5 (370.8)	1,224 (1,437)	3,728 (11,730)	68.73*** (25.23)	45.68** (22.08)	66.88*** (24.43)
<i>Observations</i>	210	210	210	210	210	210
<i>Number of County</i>	42	42	42	42	42	42
<i>Unit effects Country</i>	YES	YES	YES	YES	YES	YES
<i>Time effects Year</i>	YES	YES	YES	YES	YES	YES
<i>Robust</i>	YES	YES	YES	YES	YES	YES
<i>Instrumented</i>	YES	YES	YES	YES	YES	YES

Source: computed by the author

The results are in line with previous models, the *complaints* could be possibly explained by the first and second lag (in some models the results are statistically significant), and mainly by the *expenditures*. We can explain the effect of financing as follows: an increase in *expenditures* by 10%, reduces the *complaints* by 2 complaints (around 2 and 3 when control variables used are *medics* and *nurses*). The rise in the number of *beds* also decreases the number of *complaints*, but the effects are not considerable (under 1).

The analysis shows the importance of hospital financing, as a primordial factor in increasing the quality of medical acts and reducing the complaints in hospitals.

The difficulties experienced in Romania during the early phases of the COVID-19 outbreak have provided important insights into areas that require significant improvement. The healthcare system, where a mix of poor management, disregarded complaints from medical professionals, and inadequate infrastructure severely undermined the capability of the pandemic response, was where the most glaring problems were uncovered. But an unchecked spread was prevented by quickly resolving these important problems.

Despite this mostly beneficial conclusion, the COVID-19 pandemic has brought to light elements of the Romanian healthcare system that need to be improved in order to properly manage situations similar to this in the future. However, the early phases of this crisis demonstrated the significance of both acting quickly and taking certain societal factors into account when dealing with an epidemic. The optimal use of the resources and communication channels will be made possible by such future strategies throughout a continuing health crisis.

In Romania the absence of strategic planning at the national level and the lack of coordination and integration of care at the regional and local levels are major issues with governance structures. Another issue is building public trust in decision-makers and public authorities, which is crucial for the success of many different public programs (Cylus and Papanicolas, 2015; Vladescu *et al.*, 2016; Dimova *et al.*, 2018; Džakula *et al.*, 2021; OECD, 2021).

Geographic inequalities in the distribution of healthcare workers and infrastructure are another frequent problem, with rural areas frequently underserved and bigger cities frequently oversupplied. In general, there is an excess of specialists in cities and a scarcity of general practitioners and nurses in rural regions. Although they have had mixed results thus far governments have made some initiatives to address these issues with the health workforce.

The COVID-19 epidemic has caused significant problems for the healthcare systems, which were already dealing with issues including inadequate primary and preventive care, low health spending, and several other issues with how healthcare is organized and how the population is doing in terms of health.

5. CONCLUSIONS

Shocks can cause a health system to become unstable, but they can also lead to change. Governments have a special chance to increase the health system's resilience because to COVID-19. A window of opportunity is opened by the health sector's priority position. The health system's ability to evolve is demonstrated by the reform process's forward movement while under shock. A health system's resilience is also developed through enhancing its performance and guaranteeing

universal access. To further understand the best ways to progress reforms and increase resiliency to shocks in various nations, more study is required.

The pandemic crisis offers a rare chance to investigate whether the healthcare finance model is to blame for the diversity in health system performance in the face of the pandemic or whether other factors have a stronger impact on performance (Kumagai, 2021). It is crucial to comprehend this in order to learn how to regulate medical assistance systems. Measures that improve medical assistance management, increase performance, and streamline financial allocation are vulnerable to the severe pandemic impact and cannot offset its effects on the population's access to medical care (Antohei *et al.*, 2022).

The pandemic has made institutional engagement in the public health system more crucial than ever. Major pandemic-related issues including controlling the spread of COVID-19, managing labour shortages, and offering financial assistance to individuals and organizations have been handled by public health mandates, loosened rules, and policy expansion initiatives.

Numerous indicators suggest that Romania's healthcare system was not ready for the epidemic. First, Romania spends far less on public health services than the rest of the EU as a whole. Compared to the EU average of 9.8%, Romania's allocation to health as a percentage of GDP is 5%. The lack of suitable medical facilities and supplies is reflected in the low healthcare spending. For instance, hospitals have inadequate beds for acute care units and poor testing capacity. In general, the epidemic had little access to medical supplies.

The majority of Romania's healthcare facilities are out-of-date, were constructed during the communist era, have undergone sporadic renovation over the years, and are disproportionately concentrated in a few regions. The network of medical facilities in the territory was ill-prepared to handle intensive care or other forms of specialized treatment. In several of Romania's poorest counties, where the number of general practitioners has dropped noticeably over the past ten years, even early diagnostic and at-home treatment proved challenging (Social Monitor, 2021).

Massive employee departures from the Romanian healthcare system are a problem, particularly for critical pandemic specialties like nurses and intensive care professionals. Romania's public sector salaries were historically quite low when compared to those in the private sector. Healthcare earnings were reduced by a further 25% as a result of the 2009 austerity measures, which caused medical professionals to leave the country. Although healthcare worker salaries have increased significantly in recent years, there is a gap in keeping the next wave of medical specialists.

The impact of the COVID-19 pandemic's effects on society and the global economy serves as a compelling reason to examine the effectiveness of health systems in combating the current pandemic and to draw lessons for improving health systems' readiness for future pandemics.

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THIRD PARTY LITIGATION FUNDING: PURCHASING A CONTENTIOUS CLAIM AS A FORM OF INVESTMENT

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Abstract

This paper analyzes the institution of third party litigation funding, which is virtually unknown in Romanian law but is constantly evolving and frequently used in other states. This institution refers to cases in which a specialized funding company provides funds to a party that pursues a financial claim against another party in a national or cross-border litigation or arbitration case so that upon the successful conclusion of the case the funder gets a share of the damages awarded to the funded party. The issue of litigation funding is not a new one. However, using third parties to fund the pursuit of financial claims is a relatively new phenomenon, increasingly common in the world of litigation. This fast-paced growth – from a procedure specific only to certain areas of practice and certain jurisdictions to a phenomenon that has become a part of everyday activities – has motivated us to analyze and explore the way in which third party litigation funding works, focusing on elements related to the contentious claim as a financial asset and its purchasing by the professional funder as a form of investment, on the stages leading to the formation of the parties’ – the funder and the beneficiary – binding decision, as well as on the actual content of the funding agreement. Among the issues debated in relation to this institution there stand out the recent European Parliament resolution of 13 September 2022 with recommendations to the Commission on Responsible private funding of litigation, as well as the draft Directive annexed to the Resolution, which could lead to a considerable increase in the use of third party litigation funding in Europe.

Keywords: *investment; litigation; finance.*

JEL Classification: G0, G24, K0.

1. THIRD PARTY LITIGATION FUNDING – THE CONCEPT, ITS LEGAL NATURE, AND THE STAGES LEADING TO THE CONCLUSION OF THE FUNDING AGREEMENT

Cash flow will always remain the driving force of a business. For any company, the decision to use significant resources to finance litigation is a difficult one. Despite being risky and undesirable, litigation is occasionally the only solution if a customer must be forced to pay a debt or if a supplier must be forced to compensate the firm for the losses it has caused.

These two basic factors, cost and risk, are the criteria most frequently cited by litigants as determining the decision to seek alternative methods of litigation funding (Rowles-Davies, 2014).

The issue of litigation funding is not a new one. However, turning to third parties to get funds is a relatively new phenomenon, increasingly common in the world of litigation.

Its rapid rise from a procedure specific only to certain areas of practice and certain jurisdictions to a phenomenon that has become a part of day-to-day activities motivated us to understand and explore, in the present paper, the way in which third party litigation funding works, focusing on elements related to the contentious claim viewed as a financial asset and its acquisition by the professional funder as a form of investment, on the stages that lead to the formation of the parties' - the financier and the beneficiary - binding decision, as well as on the actual content of the funding agreement.

Third party litigation funding is the process whereby an entity called the funder, which has no direct interest in a case, pays the costs of one of the litigating parties, receiving in return a portion of the funded party's award. In the most common form of litigation funding, the funder's earnings are contingent on the success of the case and are paid out of the litigation proceeds (Johnson Jr., 2009; de Morpurgo, 2011).

Most financiers will request an amount that will be a multiple of the investment made or a percentage of the compensation awarded in the case, which will cover their initial investment, and an additional amount that will be their profit. Thus, funders typically seek to get a share of the award won in the litigation, which ranges from 15% to 50% depending on the costs and risks associated with funding the dispute.

Most specialist institutional funders are based in jurisdictions with an established or rapidly growing TPLF industry, for example Australia, the USA, or the UK (Ungureanu, 2018).

The funded party is usually the party that files a complaint. For example, as a prudent claimant, a commercial organization will want to consider all the available means to protect its business from the financial risks it may be exposed to during the litigation. Various methods of funding the case will be discussed. Besides having to pay its own lawyers, the claimant will need to consider the risk of paying the defendant's costs if the litigation outcome is not the expected one (Rowles-Davies, 2014).

The funding process will essentially involve a detailed analysis of the case and of the claimant-client, with a special focus on whether the potential defendant possesses the means to pay the estimated award in the event of a resolution that favours the client (Xiao, 2015).

This stage will include an internal risk assessment procedure (Shannon, 2015), but external legal opinions may also be sought. If the initial analysis is positive as far as the merits and grounds of the case are concerned, the funder will make an indicative funding offer, establishing a series of indicative terms which do not imply any obligation for the parties. Based on this, the funder and the

customer will negotiate the initial terms of the funding agreement, which will be subject to further due diligence (Abrams and Chen, 2013).

If the result of the due diligence assessment (JDSUPRA, 2023) is positive, the next step involves finalizing the clauses of the actual litigation funding agreement.

We believe that most funders see themselves as investors, and given that litigation investment is a relatively new phenomenon, it is our opinion that recognizing and mentioning the funder's role and influence in the procedural rules applicable to commercial disputes is a step forward in ensuring that funders are constructive forces in the dispute resolution process.

At this point, we touch upon the issue of identifying the legal nature of the third party litigation funding agreement, as well as the economic nature of the third party litigation funding mechanism.

Thus, financial investments are inevitably transactional in nature because they involve from the start the investment of an amount of money by an investor who expects to receive back the amount invested, plus an additional amount, at some point in the future (Shannon, 2015). However, the same description applies to a loan, and in the latter case, interest rate regulations protect borrowers from excessive interest rate increases. The question naturally arises as to why third party funding is not viewed as a loan, but as an investment, and why are usury regulations not applicable to it?

There are several reasons. First, the funded litigant has no absolute obligation to reimburse the funder for the amount invested in the litigation (Shannon, 2015). If the client is the claimant, then the funder is repaid only if the claimant wins the case.

If the client is the defendant, the contingency fee is awarded as soon as the case is settled in favour of the defendant, and if the defendant loses, the funder will not receive the contingency fee at all (Cremades, 2011).

Second, litigation funding is non-recourse, which means that if the client loses the case, the funder cannot seize other assets of the client, unrelated to the litigation, in order to obtain benefits (Shannon, 2015).

Third, the litigation funder is looking for a much higher return rate than a traditional lender.

Fourth, further differentiating litigation funding from a loan, funders assume a greater risk than in the case of unsecured loans, because the loan agreement is a bilateral synallagmatic contract, while third party funding is a multilateral synallagmatic agreement. The lender and the borrower enter into an agreement based on a commitment by the borrower to repay the costs of the loan at regular intervals (Shannon, 2015), with no third party involved.

However, the funder and the client enter into an agreement based on an estimate of what a judge or an arbitrator might decide at an unknown future date, or an estimate of the settlement that the client and the opposing party might reach

at an unknown future date. Thus, a litigation funding mechanism must rely on two additional actors (the judge or the arbitrator and the opposing party), which greatly increases the transaction's risk.

Fifth, information is asymmetrical, because at the beginning of the funding procedure the funder and the client, as a rule, do not yet have access to documents or other evidence belonging to the other party, so they cannot foresee with sufficient certainty that they will win the case. Under these circumstances, we understand why it is not reasonable for third party litigation funding to be subject to the same restrictions as lending by traditional lenders (Steinitz and Field, 2014).

In fact, the funder and the client view the funder's input as an investment and a variety of factors determine the rate of return on that investment. As such, unlike a loan agreement where the debtor knows at all times the value of the amount owed, the value of a litigation funding facility changes over time based on the actions taken and the information obtained during litigation or arbitration.

The funder buys the right to receive a share of the possible litigation award and continues to invest fuelled by the hope that the amount recovered will far exceed the initial investment in the future. Funders are not interested in getting only the amount they invested, therefore they will only invest if they assess that there is a real chance of multiplying their investment beyond the limit of their initial capital input. In fact, the funder often calculates the rate of return as a multiple of the amount invested rather than as a percentage of the amount recovered (Shannon, 2015).

From our point of view, it is certain that the funders' expectations regarding their return on capital and profit are similar to the expectations that creditors have regarding their return of the initial loan and, additionally, the interest paid. On the other hand, the obligation of the third party funded client to repay the funds is contingent on the recovery of the claim upon the resolution of the litigation. Thus, unlike in the case of a loan, the client does not have an absolute obligation to repay the funds to the funder or to provide the funder with a profit, the obligation being conditional on obtaining the litigation award.

Considering all the preceding arguments, it is the author's opinion that the legal nature of the third party litigation funding agreement is not that of a loan, but that the economic nature of the third party litigation funding procedure is that of investment.

The European Parliament Resolution of 13 September 2022 with recommendations to the Commission on Responsible private funding of litigation (2020/2130(INL)) itself refers to litigation funders as private investors, stating that commercial third party litigation funding (TPLF) is a growing practice whereby private investors ("litigation funders") who are not a party to a dispute invest for profit in legal proceedings and pay legal and other expenses, in exchange for a share of any eventual award.

The European Parliament and the Council of the European Union have elaborated, annexed to this Resolution, a proposal for a Directive on the regulation of third party litigation funding, which supports an idea already advanced in legal literature, namely the introduction of regulatory standards by category: transactional (concerning the conclusion of the funding agreement), procedural (litigation in court) and ethical (Shannon, 2015).

This kind of model-regulation establishes guidelines upon which states could build and adapt their laws, using common, harmonized regulatory standards to foster transparency and safety in the third party funding industry, while removing the lack of trust and any concerns regarding the involvement of funders in the resolution of disputes.

Each jurisdiction and legal system could adapt each of these regulations to their own domestic needs, and cross-border collaboration to design the general principles governing third party funding would require jurisdictions to familiarize themselves with the rules of other jurisdictions. Moreover, local courts would learn the rules applicable to a case in order to recognize, enforce, dismiss, set aside, or invalidate the damages obtained in a case funded from another state (Shannon, 2015).

2. THE ADVANTAGES OF THIRD PARTY LITIGATION FUNDING

The rise of litigation funding in recent years is the result of several different factors, including its widespread availability and the unavailability of public funds in general.

Risk aversion, more than the inability to pay expenses, is also an important reason for the growing popularity of funding.

In what follows we will explore one of the outstanding advantages of using this procedure, i.e. maintaining the financial stability of the company that has decided to use this mechanism.

The potential impact on the company's economic and financial viability and stability may deter a party from taking its dispute to court.

Third party funding transfers the responsibility of covering legal expenses to the funder, thus giving more companies the opportunity to engage in litigation while giving them the security needed to maintain sufficient cash flow to avoid financial problems (Kirtley and Wietrzykowski, 2013). Thus, when pursuing a claim that meets all the conditions to be found meritorious, they can continue their usual activity or even invest in new activities. Companies could withdraw from litigations if their possible continuation would endanger their liquidity. At that moment, they will weigh up the factors that could lead to the biggest problems: lack of liquidity, which would translate into the stagnation of the business, or giving up the claim and stopping the litigation. Funding can be a solution to this dilemma, as it allows the party using it to remove the financial risk and the

litigation cost from its financial situation, transferring them to the funder, while at the same time being able to continue its usual activity (de Boulle, 2014).

In many litigations, the main concern is the possible loss of the case, which would mean that the claimant would be liable not only for their own legal expenses, but also for the defendant's costs (de Boulle, 2014). The ability to disseminate and share these financial risks with a third party can be attractive even to clients with strong businesses and cash flows.

Below, we will examine how a company can benefit from the transfer of the risk associated with a litigation investment and why an entity that owns a portfolio of litigation claims is better able to bear and manage this risk.

Thus, from an economic point of view, legal actions based on monetary claims are regarded as patrimonial assets, being similar to bonds or other financial instruments; once an award is obtained through a court decision or through a judicial transaction, it gives the creditor of the claim the right to be paid under the stipulated conditions. Unlike a bond, however, it is uncertain whether the asset will actually mature. A bond entitles the holder to payment by itself. However, to become a value, a contentious claim must survive legal system proceedings.

Thus, an investment in a single legal claim carries substantial risk (Drucker, 2015).

Using litigation funding allows a company to better manage and fund its litigation claims and to improve the productivity of its resources overall.

As an illustration, let us imagine a company facing the prospect of having to take legal action to repair an injury and obtain damages.

As stated above, the legal claim (i.e., the litigious claim) can be viewed, from an economic point of view, as an asset, an asset that can be *monetized* (converted into money).

The company should take the following steps when considering whether to monetize the asset represented by the disputed claim: the first step is to estimate the litigation budget. The budget should include all the fees and expenses related to the litigation, at all its procedural stages (Drucker, 2015).

The second step involves approximating the duration of the litigation, and the third step, determining the estimated return on the company's investment.

In the fourth stage, the company carries out a cost analysis of the opportunity to promote the legal action, by summing up the costs of the litigation itself and the opportunity cost of giving up other operational uses of the capital (business operations, for example, marketing, capital expenditure, research and development, etc.).

The maximum return comes from investing monetary funds in litigation (proceeding with the legal action) because the return profile of litigation investment is binary [1], while the return profile of business investment has a wide range of likely outcomes.

The use of third party litigation funding is advantageous to the company, as it creates the highest expected return and the narrowest range of potential outcomes. The company can monetize its litigious claim and invest in its business. Similarly, by using the third party litigation funding mechanism, a company that defends itself in a dispute can optimally protect its own capital by continuing to invest in business-related projects (Drucker, 2015).

Many of the companies that benefit the most from third party litigation funding are in the growth phase of their life cycle, and many of these companies seek to generate profits by rapidly increasing their company valuation. In a favourable economic environment, companies can reach valuations that exceed their revenues by as much as 20 times.

Litigation income is considered non-operating income, being reported on an income statement separated from operating income, and is generally viewed as a one-time gain rather than recurring profit (basis of valuation). This means that when considering the impact of an investment on the value of a company, the return generated by an investment in the company whose litigation requires funding will be given a greater weight and thus the value of the company's return is maximized by its use of litigation funding; the company's valuation is superior when using this mechanism compared to business-only investments or litigation-only investments (Drucker, 2015).

Let us now answer the question of why a litigation funder has a greater ability to support and manage the risk associated with monetizing a legal claim.

As shown above, litigation funding can help a company to optimally allocate its resources. This is possible because the litigation funder places a higher value on the disputed claim than the company.

In other words, the litigation funder is willing to invest the necessary amount in the litigating company, in exchange for (i) the return of its capital and (ii) a fraction or percentage of the remaining revenues obtained in the litigation, while the economic director of the company may have difficulties in making the same investment in exchange of the full amount obtained after winning the litigation.

But why does the litigation funder place a higher value on the litigious claim than the company? The answer is that out of the two potential investors in the asset represented by the disputed claim the litigation funder incurs a lower capital cost (Drucker, 2015).

The cost of capital is the level of profit required to own an asset. In general, investors must be compensated for both the time value of the money invested and the risk that the return on an asset (in this case, the disputed claim) will be less than the expected return (i.e., the return of the investment plus profit, from the award received after winning the claim in court). The assets that hold a higher risk require higher returns and involve a higher capital cost (Drucker, 2016).

To conclude, holding a diversified portfolio of litigation claims reduces abruptly the risk associated with investing in a single legal claim and therefore

allows an investor to invest in the litigious claim for a substantially lower compensation.

Since a funder holding a portfolio of assets consisting of legal claims requires less compensation for investing in the contentious claim (having a lower capital cost because the risk is lower), the same asset is worth more to the funder than to a company that has only one (or a few) litigious claim(s).

3. CONCLUSIONS. CREATING A SECONDARY MARKET FOR LEGAL CLAIMS

The rise of the third party litigation funding sector - representing the primary market for legal claims - has also had collateral effects. Thus, in recent years, a secondary market for legal claims has also developed. More often than not, this secondary market takes the form of litigation funding companies that begin to sell shares and go public (Stenitz, 2011).

In the future we may also see the creation of a new type of securities, legal-claim-backed securities.

The literature provides several examples of creditors specialized in litigation funding who already use the aggregation (pooling) of the legal claims they agreed to fund [2], and sell shares issued on the receivables represented by these legal claims (Stenitz, 2011).

The idea that the securitization of this new class of assets, i.e., legal claims, could become a reality in the near future is further supported by the observation that the first wave of third party litigation funding as a primary market also generated a series of secondary transactions based on legal claims. Thus, some litigations were financed by trading (i.e., selling shares issued based on claims), and there are even some cases when the shares issued based on claims subject to future court decisions were traded on Nasdaq (Stenitz, 2011).

NOTES

[1] Win or lose.

[2] *Aggregate claims* refer to the total value of receivables based on legal claims.

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OPERATIONALISING ARTIFICIAL INTELLIGENCE ETHICAL PRINCIPLES IN BUSINESS – A CONCEPTUAL FRAMEWORK

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Abstract

Historically, technology was always a key differentiator and an enabler for business or societal developments. With the rapid advancements in technology, businesses have been able to increase their efficiency, productivity, or profitability through automation and digitization. The European Union elaborated clear strategies that aims overall economic development through digital transformation, one of the core technology components being Artificial Intelligence (AI). While the added value of AI technologies, in terms of optimization, efficiency, automation is clear and undeniable, there are different challenges related to the ethical aspect of AI use. Hence the AI ethics discussions are currently very present in the public space. A collection of different AI ethical frameworks was redacted either by the researchers or by governments or by the tech industry, but developing consistent AI ethical system is still a grey area. Some of the main challenges revealed by different researchers are related to the practical implementation of ethical principles in AI technologies during its lifecycle.

This paper proposes a conceptual framework for operationalizing AI ethical principles in business contexts. The framework is based on a comprehensive literature review of existing AI ethical frameworks, which highlights the current gaps in their implementation. The proposed framework addresses these gaps by providing a step-by-step approach that can be easily integrated into existing business processes. It covers various stages of AI development, including problem formulation, data collection and preprocessing, model training, model evaluation, and deployment. The practical validation of the framework will be conducted in future work. The results suggest that the proposed framework can provide a systematic approach to operationalizing AI ethical principles in business contexts, thereby contributing to the development of responsible AI systems.

Keywords: *artificial intelligence; ethics, framework; practice; business.*

JEL Classification: M15.

1. INTRODUCTION

The study of ethics applicable to Artificial Intelligence technologies is still in an early stage that presents unexplored opportunities from a scientific point of view. At the same time, it is observed that as companies adopt AI more and more, defining and promoting ethical principles related to AI is widely seen as one of the best ways to ensure that AI does not cause unintended harm.

Since the early stages of AI development, researchers have expressed concern about the ethical implications of its use in society (see Turing, 1950; Wiener, 1954). As AI technologies have developed, it has been found that they can have a tangible and significant impact on people's daily lives, such as influencing decision-making, improving quality of life, automating routines, and so on. As a result, the discourse on AI ethics has moved out of the academic enclave and entered the consciousness of the public and decision-makers (Barn 2019).

Therefore, there has been a rapid proliferation of ethical documents and declarations based primarily on principles, frameworks, standards, and codes of conduct proposed by the AI development industry, academia, or governmental and non-governmental organizations (national, European or global). European Comission has defined clear priorities and rules related to the development and use of AI. Therefore, they redacted a *Proposal for AI regulation* that suggest “*adopting a human-centric approach for digital technologies including artificial intelligence*” (European Comission, 2021). It has become increasingly clear that, although the existence of these documents may be necessary for creating the pro-ethical conditions so necessary (Floridi, 2019), the practical implementation of ethics at the AI level is far from being achieved (Vidgen *et al.*, 2020).

This is because many ethical principles dedicated to AI frameworks cannot be clearly implemented in practice, as demonstrated by some research (Haas, Gießler and Thiel, 2020; Morley, Elhalal and Garcia, 2021). There are studies that show that although ethical frameworks can be effective for promotion campaigns, they fail to manage the ethical operationalization of AI, with the risk of causing some of the damages they are intended to prevent (Ville *et al.*, 2019; Burt, 2020). Previous research (Floridi *et al.*, 2018; Morley *et al.*, 2023) shows that from the perspective of operationalizing an AI ethical framework, the businesses need to find solutions to a series of issues related to ethical management of an AI or to the specific limitations and motivation that AI developers may have when trying to implement AI ethical principles. Nevertheless, there is still a grey area when it come about measuring and tracking the ethical or unethical decisions of an AI.

To ensure that AI brings the anticipated added value, we must first comprehensively and interculturallly understand the potential ethical risks related to AI development. Hence an AI ethical framework should combine both elements of ethical theory (such socio-cultural aspects) and technical elements.

Our research aims to develop an ethical framework applicable to AI that targets the operationalization of ethical principles from the moment of development to the implementation and post-implementation of an AI technology. Additionally, it is important to note that, in the scientific approach, we consider ethics to be more of a *continuous process*, rather than just a task.

The initial research questions that lead us to the development of our AI ethical framework were: *How ethical principles or moral norms can be created at the level of the AI algorithms or AI training models? How can we ensure that the ethical norms we want to define are essentially correctly understood by a software developer or an AI practitioner? How can we ensure that AI technologies can handle possible deviations from some ethical norms?* This paper does not claim to have a priori answer to these questions, but through the chosen methodology and the proposed AI ethical framework, we aimed to obtain concrete results that will allow interested companies to have ethical control and integrated management when implementing AI technologies.

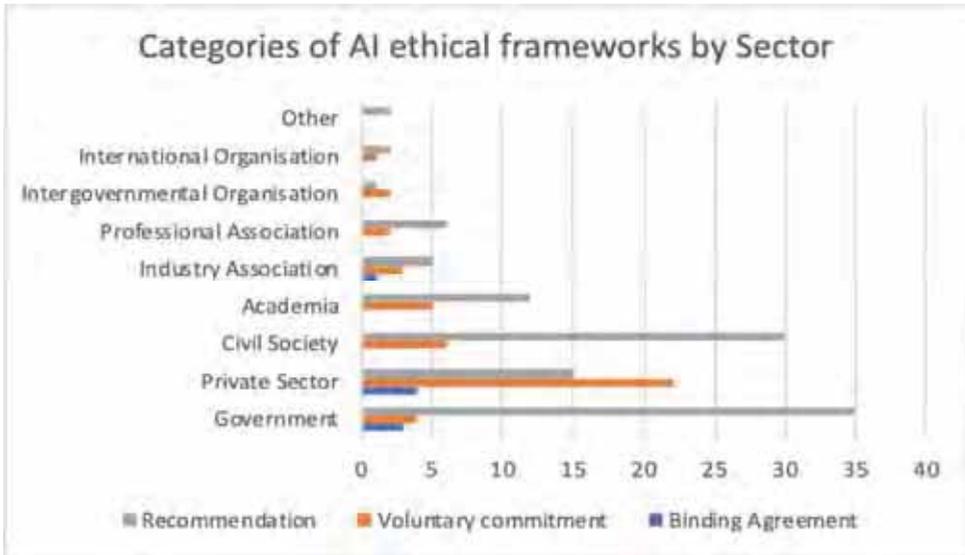
2. LITERATURE REVIEW

Through an examination of the current literature, it has been observed that numerous recent publications have highlighted a notable deficiency in many ethical frameworks applicable to artificial intelligence (AI), namely, the absence of essential considerations regarding how ethical values can be effectively implemented in practice (Hagendorff, 2020; Morley *et al.*, 2020). Furthermore, in addition to the lack of operationalization of ethical norms within AI ethics frameworks, some researchers have also noted the absence of guidance regarding the potential consequences - including legal, compliance, security, and other ramifications - of possible ethical deviations resulting from AI decisions (Jobin, Ienca and Vayena, 2019; Mittelstadt, 2019; Hagendorff, 2020).

In conducting a review of literature on the subject, we have identified a multitude of documents created by diverse stakeholders, including technology industry producers (such as Google, IBM, Microsoft, Amazon, etc.), governments (such as those behind the Montreal Declaration, the UK House of Lords Select Committee on AI, the European Commission's HLEG European Council, UNESCO, OECD, and others), and academic institutions (such as the Future of Life Institute, IEEE, AI4People, Japanese Society of AI, Oxford Digital Labs, among others). The authors of these documents seek to formalize presented principles (Anderson and Anderson, 2021) by proposing normative constraints (Turilli, 2007) on what an AI technology can and cannot do in society.

However, the existent frameworks do not always provide clear directions for the practical operationalization of ethical principles at the technical level.

Furthermore, according to Algorithmwatch.org, in 2019 (see Figure 1), it is shown that ethical guidelines for AI did not have enforcement mechanisms.



Source: Algorithm Watch (2023)

Figure 1. Distribution of the AI ethical frameworks by its issuers

Out of 160 documents presented in the AlgorithmWatch.org database, only 10 have practical enforcement mechanisms. Both private sector and public sector policies are mostly voluntary commitments or general recommendations. Surprisingly, the private sector relies largely on voluntary commitments, while government actors make recommendations for administrative institutions. Many of the AI ethics guidelines contain a wording that minimizes the scope of the document, presenting them as proposals.

A consensus has emerged among academic, industry, and governmental stakeholders that the operationalization of AI ethics should serve as a reference point for communicating expectations and evaluating the results and effects of AI. Nevertheless, challenges remain in this regard. As Hagendorff (2020) notes, although nearly all existing AI ethics guidelines propose technical solutions, few provide technical explanations. Consequently, AI practitioners may encounter difficulties in operationalizing the sometimes-abstract ethical principles at the algorithmic level (Calvo and Peters, 2019). The gap between ethical principles and their practical implementation is considerable and influenced by factors such as complexity, variability, subjectivity, and a lack of standardization, including variable interpretation of the "components" of each ethical principle (Alshammari and Simpson, 2017).

Our research underscores the importance of a complete (end-to-end) approach when discussing the significance of an ethical framework applicable to AI technologies. Research findings (Morley, Elhalal and Garcia, 2021)

demonstrate that AI practitioners possess an abstract and relatively narrow understanding of ethical principles and how they can be translated into practice. This suggests that AI practitioners are primarily motivated to translate ethical principles into practice to comply with legislative requirements. As Morley, Elhalal and Garcia (2021) note, this appears to be the sole justification for investing additional resources in AI product design. Furthermore, legislation in this area is not yet consistent and fails to keep pace with changes in social norms or attitudes, which can occur quite rapidly (especially in the digital environment).

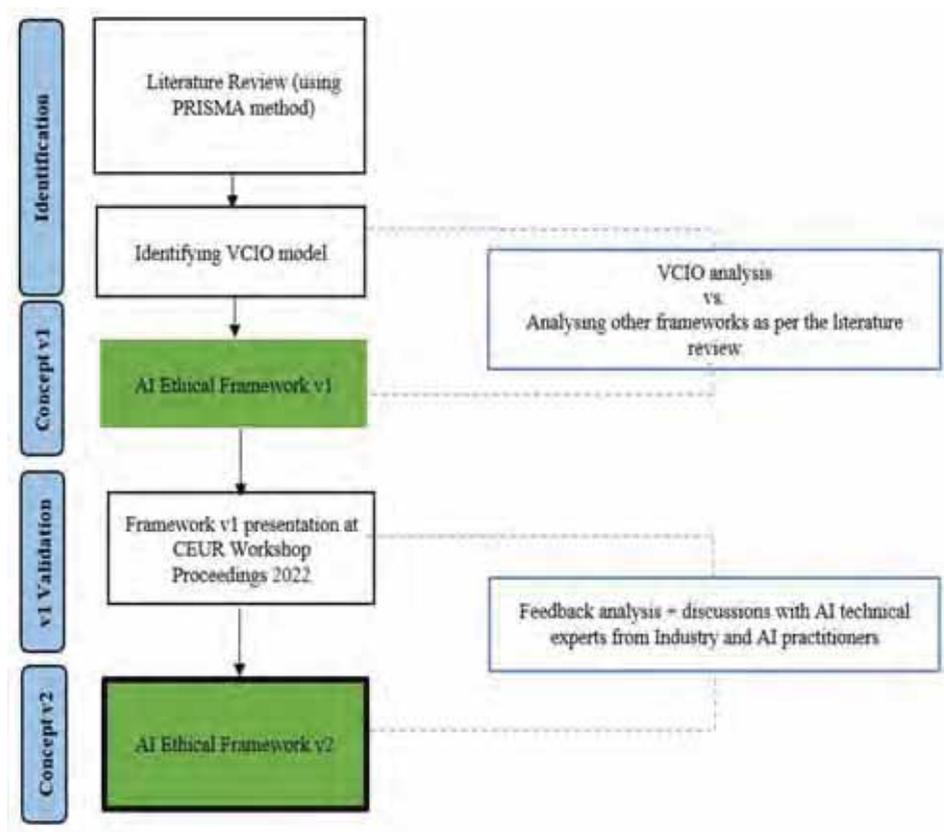
Building upon the aforementioned aspects, our research proposes an ethical framework applicable to AI technologies that has the capability to operationalize and transpose ethical principles from theoretical into the practical implementation at the level of AI practitioners. Recent studies (Ayling and Chapman, 2022) emphasize the importance of developing/analysing an ethical framework from three perspectives: *evaluating the impact of the framework, the ability to audit the framework, and the availability of technical tools within the framework for designing AI ethics.*

There are diverse approaches to what an ethical framework should or should not contain, just as there are different prescriptive approaches to what an ethical AI technology should mean. For this paper, we considered designing an AI ethical framework that should bring *added value* within a business organization that want to implement AI ethical technology. The approach of the ethical design of an AI technology centered on added value (for individuals, society, etc.) is not new (Stephanidis *et al.*, 2019), but it seems to be a necessary condition for operationalizing the ethical principles applicable to AI.

3. METHODOLOGY

The research method that was adopted to create the ethical framework we propose is illustrated in Figure 2. As a starting point we considered the analysis of the existing scientific literature as described above. For that we used PRISMA method and that helped us to analyses ethical principles and ethical guidelines applicable to AI. Based on this analysis we have identified the VCIO ethical guide (Hallensleben *et al.*, 2020) that has a practical description of the implementation of ethical principles in AI technologies based on *Values, Criteria, Identifiers and Observables*. One important note is that based on the analysis of other related works on ethics, we concluded that, although the VCIO ethics guide makes a step forward from the perspective of operationalizing AI ethics, it lacks on technical elements related on how ethical principles must be managed at the datasets or AI training models level. Thus, we proposed the addition of our vision to complete the VCIO ethical framework, aiming to create an ethical framework that addresses both the normative aspects of ethical principles and the technical elements specific to practical implementation at the level of AI technologies. This first version of the ethical framework that we proposed obtained a first scientific validation in the

CEUR Proceedings I-ESA 2022 conference (Ciobanu and Meșniță, 2022). Starting from the obtained feedback, we conducted a series of discussions with AI experts and AI practitioners after which we obtained the final version that we propose in this research paper.

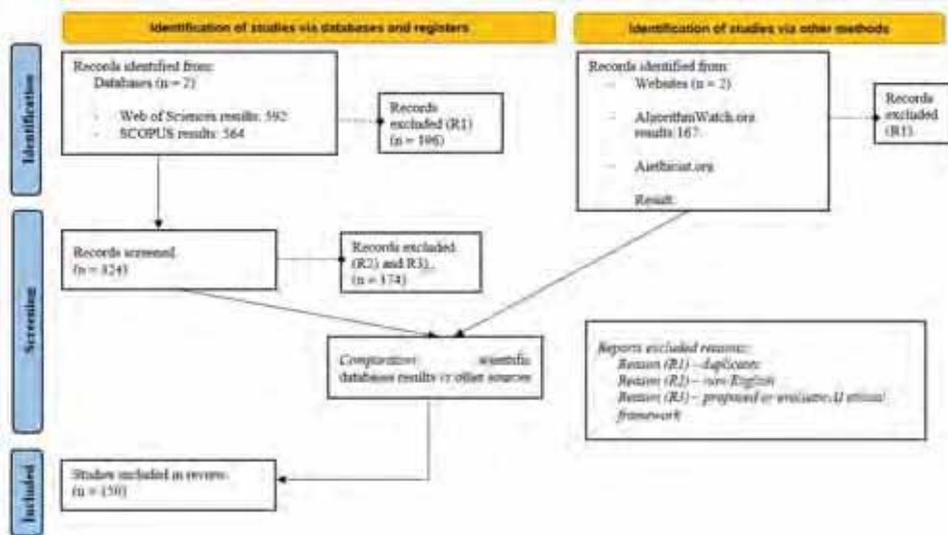


Source: self-representation

Figure 2. Methodology design to identify the proposed AI ethical framework

3.1 Using PRISMA method to identify the relevant AI ethical frameworks

The PRIMSA method was used as per Figure 3, to have a more detailed picture of other research that addresses a) the ethical issues that can be imposed on AI technologies and b) the current state of the practical applicability of existing ethical frameworks that facilitate the development, implementation and monitoring of AI technologies.



Source: self-representation

Figure 3. The use of PRISMA method to identify the most relevant AI ethical frameworks

This way we have identified that the main challenge of AI ethical frameworks are one related to the operationalisation of the ethical principles in practice. At the same time, this first methodological approach also highlighted the requirements that must be met in order to move from the normative approach to the need for ethics in AI to how we achieve the practical implementation of ethical principles in an AI technology. Also we identified the VCIO model (Hallensleben and Hustdet, 2020) which stands out as a good guide candidate that can (in a first phase) translate ethical principles from the perspective of AI applicability.

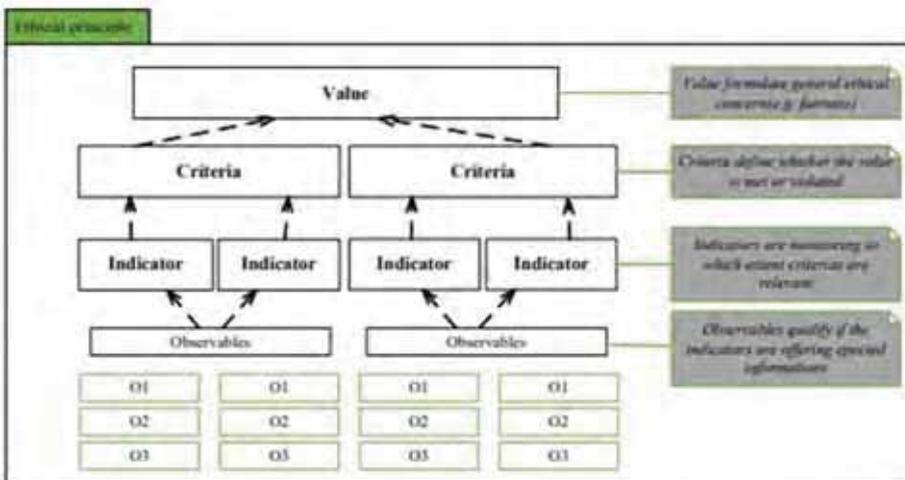
3.2 The VCIO AI Ethical model

The VCIO model is the result of a joint effort of an interdisciplinary group of experts called AI Ethics Impact Group (Hallensleben and Hustdet, 2020). By comparison with other ethics guidelines studied for this paper, VCIO brings as a novelty the need to measure ethical principles according to the field of applicability of an AI technology. Prescriptive ethical values, such as transparency or non-discrimination, are understood in different ways by different people or industries. This leads to uncertainty within organizations developing AI systems, while also hampering the work of AI regulators. The lack of specific and verifiable principles thus undermines the effectiveness of ethical guidelines.

The VCIO model highlights four essential components for operationalizing and evaluating ethical principles applicable to AI: *values, criteria, indicators and*

observables. Ethical principles are identified as abstracted values (similar to the subjectivism specific to the definition of ethical principles). The VCIO model framework shows that it is essential to have other components to perform these tasks. Thus, the criteria, indicators and observables can be used in defining the values that are proposed.

In order to practically implement AI ethics, the VCIO model comprises 4 levels (see Figure 4) that allow the operationalization or translation of ethical principles from theoretical norms into practical implementation tasks.



Source: adapted from AI Ethics Group Impact (2020)

Figure 4. High level functions of the VCIO model

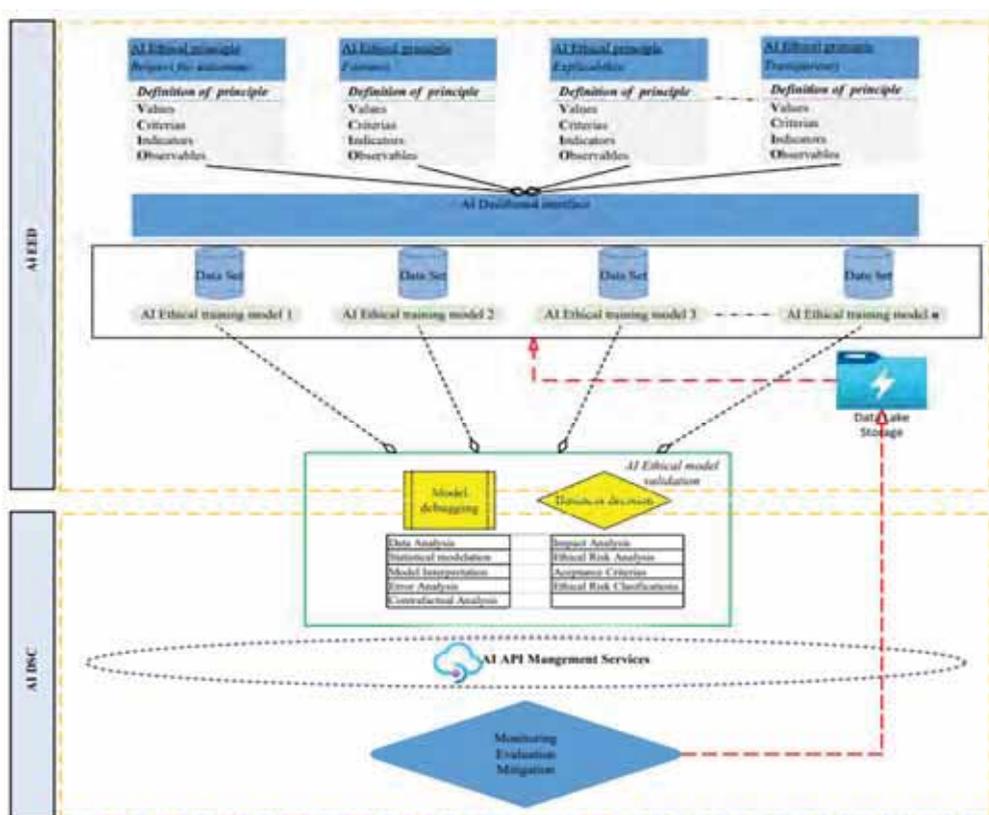
Summarizing, we considered the VCIO model as a starting point for the framework we propose, because it can define the requirements necessary to achieve a certain value that is identified with ethical principles. From a scientific point of view, the model can help operationalize ethical principles by concretizing general values and by breaking them down into measurable criteria, indicators and observables. On the other hand, there seems to be a lack of argumentation of the technical details that should be considered for the translation from *a)* ethical principles defined by values and concretely measured by criteria, indicators and observables *to b)* their implementation at the algorithmic level in the training models that are the basis of AI. In the framework we proposed VCIO framework could be seen rather as tool or instrument that can be used in the initial phase of explaining what an ethical principle should mean for an AI technology.

Hence, we are suggesting a unified AI ethical framework that includes both the methods by which we can translate the ethical values (according to the VCIO

model) into the training models, and a detection and updating mechanism once ethical deviations are detected in the initial algorithms.

4. OUR APPROACH FOR AN AI ETHICAL FRAMEWORK FOR BUSINESS

In this section of the research, we will describe the components of the proposed ethical framework (v2) applicable to AI technologies implemented in business organizations. As a result of the methodological approach detailed in the previous section, this framework v2 is an updated version of the framework v1 (Ciobanu and Meșniță, 2022) and brings additions related to the technical control elements of the training models, as well as functions related to the decision-making model related to the ethical aspects relevant to the business, as a result of the implementation of AI. (See Figure 5).



Source: self-representation

Figure 5. An AI Ethical framework for business organizations

The framework is divided into two conceptual sections connected through API (Application Programming Interface) systems, through which we suggest a holistic approach to operationalizing an AI system that addresses challenges from both AI producers and consumers.

4.1 AI Embedded Ethics By Design (AI EED)

AI Ethics By Design is not a new concept in the field of AI. A number of authors (Dignum, Baldoni, and Baroglio, 2018; Kieslich *et al.*, 2022; Craigon, Sacks, and Brewer, 2023) as well as governmental structures (European Commission, 2020) bring into debate the need to consider ethical aspects from the development phases of AI technologies.

Our research approaches the need for AI technology to be ethical by design from a different perspective. That's why the first component of our ethical framework is called Embedded Ethics By Design (AI EED). Our framework proposes through the AI EED component that every platform that can run or develop AI technologies have capabilities through which developers can train the models from the point of view of the ethical principles that must be respected.

This phase is considered to be a proactive way (of piloting the technology in question) that can be implemented by each organization before putting a particular AI system into production, taking into account the cultural context, the industry in which that AI technology is being implemented, the potential impact as well as who are the stakeholders involved in the subsequent management of the implemented system.

4.2 AI Desired Stated Configuration (AI DSC)

AI DSC is the component by which an AI technology is managed after its implementation, ensuring reliability and continuous updating of the underlying training models in different contexts with reference to ethical issues. Through the AI EED component of the proposed framework, it is possible to define and operationalize the ethical principles and values that a technology must incorporate at the algorithmic level (from the training model development phase). Post-implementation in production, an AI technology requires management that allows training models to be updated with new "scenarios" or "ethical challenges" that the technology can learn from new data obtained. As we showed in the Introduction section of this paper, validating the existence of ethics in AI technology decisions is not a one-time task or exercise. There is a need to ensure an ongoing process to validate, re-validate and refresh an AI technology post implementation. Our framework proposes three mechanisms (Monitoring, Evaluation, Mitigation) through which AI technologies can be ethically re-validated and updated once they have been implemented.

In the following sections we will focus the functional elements of the AI Ethical Validation Model component and the Monitoring component because these two are key differentiators for the proposed framework.

4.3 Functional aspects of the framework for the validation of ethical elements in Artificial Intelligence

In this section of the research, the relational elements of the ethical validation framework applicable to Artificial Intelligence will be described at the functional level. A series of conceptual definitions are required for a better interpretation of each element presented in the two components AI EED and AI DSC of the framework (according to Figure 5).

The AI Ethical Principle (PrinEticIA) - refers to moral values intended to help the development, implementation and responsible use of AI technologies.

AI Dashboard Interface (IntAdm IA) - refers to the graphical interface used to access the AI technology to be developed and trained.

Data Set (DS) - refer to categories of data that can be used at the algorithmic level in AI development.

Model Debugging - the training of an AI model through a set of techniques and tools to analyse/interpret the training model from an ethical perspective.

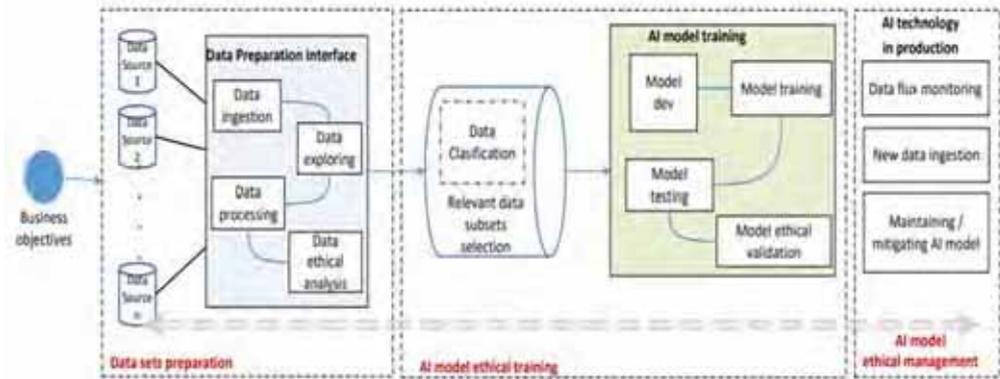
AI ethical validation model (AI EVM) - represents an analysis and decision stage, which includes two elements: model adjustment and a decision aiming to validate if an AI can be implemented under optimal conditions in production.

In the below sections we will describe the high-level architecture of the most important components of our frameworks, namely: the *DataSet*, the *AI Ethical Validation* model and the *AI DSC Monitoring* component. There are other functional elements in the framework that will be further described in future research papers.

4.3.1 The importance of DataSets for an AI ethical technology

The data set used to train the AI technology is a basic element, crucial to achieve the initially defined or anticipated ethical effects. Ideally, the data set should contain information as relevant as possible to the field in which the AI technology will be applied. Thus, it is extremely important that the data and data sources used by companies that want to implement AI technologies are analysed and verified to exclude possible ethical inconsistencies or biases that already exist at the data level.

Within the Figure 6 we are suggesting a method that is proposed by our framework and can be used to ethically identify and prepare data that is ingested in AI solutions.



Source: self-representation

Figure 6. Ingesting data in AI models while applying the ethical validation model

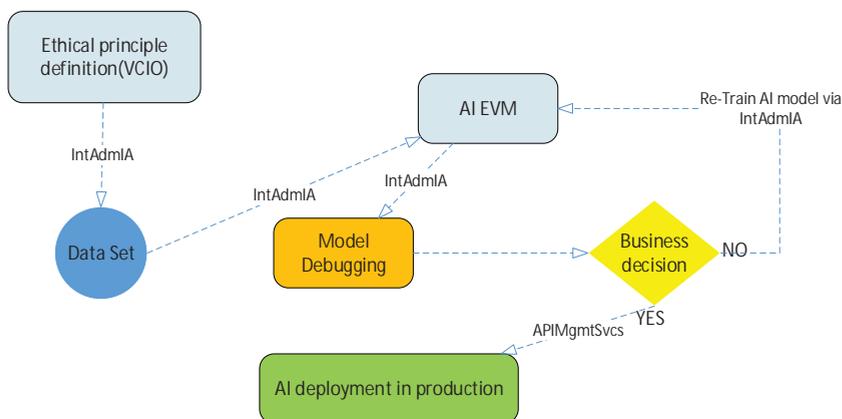
The process described in Figure 6 should be approached as a series of cyclical and interconnected activities and not as single-execution tasks to move to the next stage. For example, in the process of ethical training of the model, the lack of a certain category of data can be identified, which can lead to the identification of other sources of data to be prepared, classified, etc.

4.3.2 The AI ethical validation model of the proposed framework

Once the training model associated with the AI technology to be developed/implemented is created, an ethical evaluation of it is proposed in relation to the ethical principles defined by VCIO. This step is part of the AI EED component and is essential in ethically testing and validating AI technology before it is deployed in production. This stage in the framework proposes the creation of a process of ethical adjustment of the model (model debugging) whose results are correlated with a decision aimed at the initially defining ethical principles from the perspective of business objectives.

The ethical adjustment of the model (model debugging) consists in the use of those techniques that validate from a technical and functional point of view the decision-making mode of the AI technology. The framework proposes a list of open-source techniques already used by the industry (see Microsoft Responsible AI Dashboard) for the ethical validation of the training model. The list is not exhaustive and can always be adjusted according to the specific needs of the type of AI and its applicability.

In Figure 7 there’s a schematic approach to the main stages within AI EVM that aim to train the AI model from an ethical point of view in order to implement AI technology in production at the level of business processes.



Source: Self-representation

Figure 7. Schematic approach to ethical validation in AI training model development

In the schema above, we represent a process of ethical validation at the level of development and testing of an AI training model, as follows:

Step 1 - Identify and define the ethical principle according to the VCIO model;

Step 2 - The relevant data sets are established;

Step 3 - The training model is built based on the identified data;

Step 4 - The training model will be ethically adjusted (if necessary);

Step 5 - Following the adjustment from step 4, the obtained input will be used, which will be correlated with the business-specific requirements. Then, a decision will be made to implement the AI in production.

Step 6 - If the decision is YES, the ethical validity of the training model is compliant with the business requirements, the AI technology will be implemented in production.

Step 7 - If the decision is NO, the training model is not considered ethical from the point of view of the business requirements, it goes back to step 3 to re-train it.

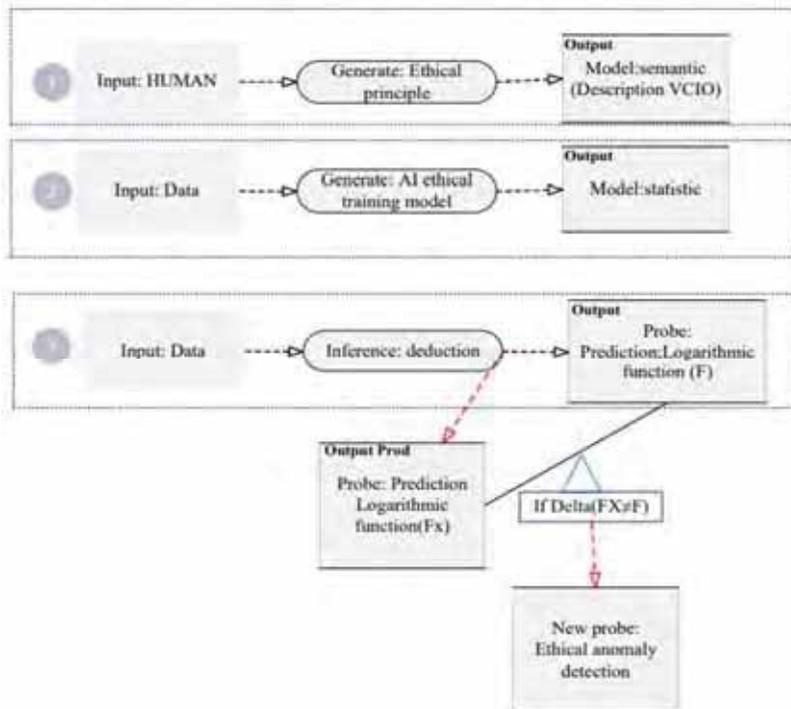
Between Step 4 and Step 5 there can be a two-way relationship in which AI practitioners technically test the model through the specific methods, communicate the results to the decision makers, so that they can propose new test scenarios based on specific business requirements.

4.3.3 The monitoring components of the AI ethical framework

Training models can certainly be tested a priori, using specific statistical and probabilistic methods, before they are released into production. However, the framework emphasizes the importance of monitoring and evaluation during the

use of AI. This mode has two major advantages: analytical reporting and traceability of possible ethical anomalies detection.

The framework, through the AI DSC component proposes an approach based on logical deductive reasoning for continuous ethical monitoring. In Figure 8 we propose the rational approach which is based on *input vs output* descriptive processes.



Source: Self-representation

Figure 8. The mechanism for detecting possible ethical anomalies post-implementation AI

Thus, a mechanism based on logical reasoning is proposed that starts from the following premises:

1. Need for a *Human* input to generate ethical principle(s) applicable to AI. *Output* will be a *semantic model* (definition of an ethical principle as per VCIO).
2. Translate from the semantic model to the logical, mathematical or statistical model, depending on the type of AI desired. Need for *Data input* to generate the basic AI training model. This process aims to obtain a *statistical representation output* (based on the initial relevant data sets).

3. AI ethical training and validation. *Input* is *Data* type, but by applying ethical training methods, the aim is to generate inferences based on *deductions*, after which a prediction-type output can result. These predictions are defined in the monitoring part of the framework as samples (**P**). Evidence is basically the sum of the predictions or decisions that are expected from an AI technology in relation to an initially defined scenario or ethical principle. Following the ethical training of the AI model will therefore result a sample that will contain predictions obtained through semantic, mathematical and statistical modeling that can be defined as logarithmic functions. As such, at this stage we will have predictions that can be defined logarithmically as **F(x)**. This will be the sample that will work as a reference for the training model implemented in production.

Following the production deployment process, depending on new data or unanticipated scenarios during the training phase, the AI training model may make decisions and provide predictions that do not align with the reference sample **F(x)**. In this case, a new sample of predictions will be deduced and mathematically defined **F(x)**'. Thus, the framework practically proposes the continuous monitoring and evaluation of the ratio between **F(x)** and **F(x)**' and the following assumptions:

I1 - If $F(x) = F(x) \rightarrow N$ (normal and expected AI ethical behavior)

- the behavior of the AI model and technology in production is ethically normal and no mitigation/adjustment is required. The originally trained ethical validity is practically confirmed.

I2 - If $F(x) \neq F(x) \rightarrow Pn$

- meaning there is a discrepancy between the expected predictions (initial sample) and the sample obtained in production (the new predictions), thus resulting in a *new sample* (**Pn**), which practically represents an potential ethical anomaly.

It should be noted that **Pn** will contain new data and information that formed the basis of the unexpected prediction. In this case *I2* should be tested by re-analyzing the data (including exploring any new data presented to the AI that led to the ethical anomaly). In order to validate *I2*, the ethical training methods established in AI EVM will be repeated to determine the cause of the anomaly. As such, the mitigation or adjustment process will begin, the framework proposing a mechanism for assimilating the new data and information that caused the ethical anomaly. It should be stated that there is also the possibility that a deviation is identified, but this is not necessarily an ethical anomaly. That is precisely why the framework's recommendation is to create a new customized data set (*DataLake type*) to retain the new data and only the ethically relevant ones to be re-assimilated into the initial training models. In this way, a separation will be

achieved between ethically relevant data for AI models and advisory data but without ethical relevance or impact.

5. CONCLUSIONS

This research paper aimed to address the question of how to establish a functional framework to ensure that AI technologies deployed in business environments make ethical decisions and produce ethical outcomes. The paper proposed an operational and comprehensive framework that can be used to validate the compliance of AI with ethical principles throughout its life cycle, from development to implementation and post-implementation in production. While the scientific literature contains numerous frameworks for the ethical validation of AI, most of them have limited practical operationalization of ethical principles in AI technologies.

The proposed framework offers an operational normalization that can translate ethical principles into a logarithmic level for practical implementation in AI technologies. The framework also emphasizes the traceability of the ethical validation process at the level of AI technologies, with two interoperable components AI EED and AI DSC that enable control over ethical principles from the perspective of business objectives and in the implementation and post-implementation phase of AI.

The proposed framework offers visibility and control over ethical validation, which is useful in situations such as computer audits. Additionally, the development of a national/international AI ethical control body that uses the proposed framework as a tool for verifying ethical norms applied in AI could be a direction for further development.

Lastly, the AI DSC monitoring and detection component of the framework also has an analytical role in providing specific information for businesses on the use of the implemented AI solution, the impact of ethical violations, and the degree of prediction of AI. This information can lead to a strategic advantage that improves the relationship between business, technology, and added value, with positive social impact. Overall, the proposed framework provides a valuable tool for ethical validation of AI technologies in business environments.

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ONLINE PLATFORMS – SUBJECTS OF THE E-CONTRACTS OR INTERMEDIARIES?

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Abstract

The article will analyse the legal framework and trends of online platforms. There will be presented new directions of online platforms that have the role to connect and to facilitate the dialog between the sellers and consumers. The importance and usage of the platforms have accelerated at an unprecedented rate since the global pandemic started. Online platforms are gates to the new business stage for young companies. Taking into account the fact that online platforms include engines, social media, online financial services and more their status is still unclear, whether they are considered partners/subjects in e-contracts or intermediaries. Additionally, online platforms include specific risks and issues to the users as: dissemination of illegal content, products and service online, such as incitement to terrorism, infringements of IP rights, manipulation of platform's system to amplify certain violence or self-harm messages, unfair business conditions for business users, unfair commercial practices, consumer protection rules ill-suited to digital world, tax avoidance, ineffective supervision of services, thus the Platform-to-Business Regulation, the Digital Services Act and the Digital Markets Act aim to address some of these gaps and form three key legislative initiatives in the field of online platform regulation. Finally, the authors will compare the trends of the online platforms and will come up with solutions of the legal status of online platforms.

Keywords: *online platforms; online intermediaries; digital contract; legal status; DSA; DMA.*

JEL Classification: P37.

1. INTRODUCTION

The aim of this contribution is to ‘unpack’ the status of the legal relationship within platform services – to provide a basis for discussion of the question whether the platform role which plays a role of the subject or intermediary in the online service market and whether the legal regulation of platform services is needed.

The structure of this research is as follows: after a brief description of the communication in e-markets (section 1), the legal framework in Europe (section 2), the legal framework in US and China (section 3), legal status of the platforms (section 4), the final part of this paper will consider new trends of developments of the platforms taking into account the new technologies and the inside world the platforms create. E-Platforms impose own 'rules', 'laws', 'arbitration' etc. that makes them play as separate subject in line with natural persons and legal entities (by status platform might belong too).

Lately there have been enormous changes in information technology, the most visible of which is the spread of the Internet as a basis for electronic business transactions. Reactions from Unites States of America (US) and European legislators as well as emerging international model laws had to be included in the inquiry. The value of such a study is not limited to the attempt to integrate the new forms of communication into the existing legal framework. On the contrary, it can result in a perspective from the extrajudicial developments of law, which can also be used to rethink and re-evaluate the structure and principles of contract law.

2. COMMUNICATION IN E-MARKETS

The market is the place where goods and services are exchanged, and the contract is the instrument for coordinating market participants. In this sense, markets can also be understood as communication networks. After starting with individual systems such as electronic exchanges, computerized reservation systems, logistics systems, the development has also taken place through the Internet and the electronic commerce ("e-Commerce") that takes place through it, is given a new quality.

The subjects of the electronic contract are individuals or legal persons who conclude a contract using electronic means, these can be two or more people who agree to establish mutual rights and obligations through electronic means of communication.

In general, the subjects of the electronic contract can be any natural or legal persons who have access to the electronic means of communication and can be identified through them. This includes, but is not limited to, persons using the Internet, mobile telephony or other electronic means of communication to enter into contracts.

Natural persons are individuals who enter into contracts for personal use, while legal entities enter into contracts on behalf of companies or other commercial entities. Both natural and legal persons can conclude electronic contracts. It is important to note that with regard to electronic contracts, the subjects are not limited to the same geographical location or the same country. Electronic contracts may be entered between persons anywhere in the world and may be governed by different laws and regulations depending on where the subjects of the contract are located and the laws of their home countries.

In addition, the subjects of the electronic contract must be able to understand and accept the terms and conditions of the contract, as well as agree on the way to use electronic means of communication to conclude the contract. They must be able to digitally sign the document containing the electronic contract to confirm their agreement to its terms and conditions.

It is important to note that the subjects of the electronic contract must have access to the electronic means of communication, as well as to the technological devices necessary to conclude and sign the contract, as well as to receive and send information related to that contract.

In addition to individual and/or legal persons, electronic contracts can also be concluded between other entities, such as governmental or non-governmental organizations and other institutions (which might also be considered as legal entities). Also, the subjects of the electronic contract may include suppliers and customers, companies and employees, as well as any other parties who wish to establish contractual relations using electronic means of communication.

Another important topic of discussion regarding e-contracts is the issue of using e-signatures to sign contractual documents by individuals and/or legal entities. Electronic signature is a method of authenticating a person who signs a document using electronic means of communication.

People using the electronic signature must meet certain technical and security requirements for it to be considered valid. In addition, the laws and regulations of different countries set specific criteria and standards for electronic signatures, so it is important to consult the applicable law before using the electronic signature in a contract.

Moreover, the subjects of the electronic contract are extremely diverse, they can be any natural or legal persons who can use electronic means of communication to conclude a contract. It is important to comply with the legal and technical requirements for an electronic contract to be considered valid and binding for all subjects involved.

Another important issue to discuss is presented by providers and intermediaries that offer intermediary services or online trading platforms for the conclusion of electronic contracts between subjects. In this research we aim to analyse the platform as subjects or intermediaries of the legal deeds concluded in online medium.

In Republic of Moldova according to art. 1013 of the Civil code preview the notion and norms on distant contracts (Civil Code, 2018). Distant contracts can also be concluded outside of decentralized systems such as the blockchain, usually being concluded directly between the professional (seller) and the consumer (buyer) or through platforms that allow the sale of goods and their procurement, on the world market there are examples such as Amazon, Ebay, Alibaba a.o. on the Simpals local market (2023). E-commerce and off-premises sales offer many advantages, but also involve compliance with rules that must be followed within

the limits of the European Union rules. Although the scope of contracts in the online environment is increasingly greater in the online environment, the rules on e-commerce and distance and off-premises sales do not cover transactions concluded in the following areas: social and health services, gambling, financial, insurance and investment products, the sale and rental of housing (for residential purposes), travel packages, services involving the right to use real estate for a limited period of time (timeshare) and certain holiday services subject to specific rules, passenger transport (with the exception of certain specific rules), signing of contracts by certain public office holders such as notaries, regular delivery of food and beverages to customers' homes or workplaces, products sold at vending machines, in some EU countries, the following off-premises rules do not apply if the value of the contracts is less than EUR 50 (European Commission, 2023).

Electronic platforms became very popular since the pandemic period and it shifted the consumer interests to the online market as it consumes less time, in some cases less money being targeted on specific product(s) which might cost less online, the returning period is also bigger compare to non-online market and other benefits offered by electronic platforms.

3. LEGAL FRAMEWORK OF ONLINE (ELECTRONIC) PLATFORMS IN EUROPE

Within the single market, it should be simple to buy goods, digital content and digital services from any EU nation. Consumers often do not know their rights when products are viced. Due to variations in national contract law, many businesses are hesitant to market their products to overseas customers. The European Commission presented two directives in 2015 to address these issues: one on contracts for the sale of goods (such as the purchase of a camera or a smart watch) and one on contracts for the provision of digital content and digital services (such as be media accounts or music streaming services).

On 20 May 2019, the European Parliament and the Council approved Directives (Directive (EU) 2019/771 and Directive (EU) 2019/770). Member States had until July 1st, 2021 to transpose them into national law after they were published in the Official Journal.

The directives harmonize important provisions of EU legislation on consumer contracts. In the millions of daily transactions involving products, smart products, digital content and digital services, this will ensure a high level of consumer protection and increase legal certainty for both consumers and traders.

Both Directive (EU) 2019/771 on certain aspects of contracts for the sale of goods and Directive (EU) 2019/770 on certain aspects of contracts for the supply of digital content and digital services entered into force on January 1st, 2021.

Videos, music files, software, live streaming events, chat programs and social networks are just a few examples of the wide variety of products that fall under the category of digital content and services.

Consumers may experience the following issues with these products:

1. the device might not play the downloaded music;
2. the purchased software suddenly stopped working.

With the new regulations, consumers will be protected against faulty digital products and services and have access to redress:

- a) asking the trader to solve the problem;
- b) if the problem persists, requesting a price reduction or terminating the contract and receiving a refund.

Such protection was previously limited to tangible assets in the EU. The consumer frequently provides the merchant with personal data in exchange for access to digital goods or services without having to pay money. Consumers now have the right to compensation for faulty digital content or services, regardless of whether they paid for it or just provided personal data, under the new Digital Content and Services Directive (EU) 2019/770.

The author Vanessa Mak (2018) in the research *Regulating online platforms – the case of AIRBNB* mentioned, the platform services such as Airbnb, Uber, eBay, Amazon, TaskRabbit and many more have rapidly increased and occupied the existing markets and services. Airbnb's peer-to-peer accommodation rental platform competes with hotels in many cities, whereas Uber invaded taxi market services. These platforms are very operative, not expensive and efficient by using people's facilities as apartments and/or cars and/or works through the fees the participants of the platform are paying, so in general it is a win-win case for both parties.

With regard to the opinion of author Vanessa Mak (2018), she highlighted 'platforms' as separate subjects in her research as follows: 'this chapter discusses the private law relationships that arise between the three parties involved in a home rental through the website: the online platform (Airbnb), the host and the guest' (Mak, 2018). In general, the structure of the contractual relationship is quite simple - a platform where individuals or legal persons as host or guests are registered (including via Google or Facebook), and agree commonly on terms and conditions of the future relations that usually are set by the platforms and with some requirements of the hosts taking into account the clients (guests) desire and disputes.

Another author Przemyslaw Jacek Palka (2018) has a contrary opinion regarding the online platform, as online platforms are seen as proprietary spaces. Mr. Palka sustains that '*terms of online services are not contracts for service in the traditional sense, since they often do not contain any obligations or promises on the side of the providers*', additional argument invoked is that it always contains some contractual elements like licensing of software and/or content, but firstly set the rules specifying what users are (not) allowed to do, favour more an exercise of property rights than contracts. Moreover, the relations between online service providers and their users should be analyzed through public/private

relations, as service providers might be *de jure* as private service providers but benefit as public in nature. Finally, the author invokes that in order to mitigate the unequal position that exists between the online service providers who unilaterally control the code and algorithms behind their platforms it should modify the consumer law in the way that consumers would benefit through constraining the power of online service providers (Palka, 2018).

There were presented by two opinions of authors that are opposite, however, the second one invokes more arguments in favour of property relations of the online service providers via controlling the code and algorithm, with regards to the first opinion we are supporting it since the relations are established by the voluntary will of the client that access platforms in order to benefit of services.

4. LEGAL FRAMEWORK OF ONLINE (ELECTRONIC) PLATFORMS IN UNITES STATES OF AMERICA (US) AND CHINA

The American and Chinese economies are interdependent, nevertheless the increasing competition and confrontation starting intellectual property rights and trade to foreign aid and technological mastery. The US-China tensions in the past few years have been experienced a battle between the two actors, big nations for tech supremacy (Khapral, 2023). Platforms have become increasingly important to the US-China rivalry and it is discussed that they should be at the focus of analyses of the ‘new state capitalism’. Platforms that generate a very high income for owners are becoming one of the main targets for business owners. For example, China is one of the largest e-commerce markets globally, generating almost 50% of the world’s transactions. According to E-Marketer data, the online transactions of China reached 2.29 trillion USD in 2020 and is forecasted to get 3.56 trillion USD by 2024 with a number of 710 million digital buyers. China is placed ahead of the US for e-commerce with a revenue of 1.5 trillion USD (International Trade Administration, 2023).

Rolf and Schindler (2023) have researched in their paper the influence of two big actors US and China on the development of platforms and conceptualized the notion of ‘state platform capitalism’ in which these actors instrumentalize and mobilise domestic platform firms in pursuit of geopolitical-economic objectives, while platforms become increasingly interdependent with their home state institutions. It is worth mentioning that the comparative issues researched by authors are quite relevant and it describes the inter influence of big players of online market. The author invokes that platforms are organizations that combine digital and physical infrastructure to intermediate and facilitate commercial social and informational exchange. The authors invoke that ‘*the platforms have boomed in the context of global economic growth due to their low start-up costs, scalability and limited assets and liabilities beyond intellectual property and a small pool of full-times workers*’ (Rolf and Schindler, 2023). According to recent data the largest

digital platforms are concentrated in US and China, so-called ‘super digital platforms’ – Apple, Amazon, Microsoft, Alphabet, Meta, Alibaba and Tencent, capitalised at US\$8.3tn at the end of 2020 (Kenney, Bearson and Zysman, 2021). However Chinese platforms are rapidly growing they are not so powerful as their Silicon Valley counterparts and remain dependent of their domestic economy. Nevertheless, the Chinese platforms are rapidly modernizing and economically growing, becoming competitive in the international market. Tencent, a communications platform and owner of WeChat alongside a large video gaming portfolio, has profits of US\$23.3bn on sales of US\$70bn in 2021, compared to those on Facebook (now Meta) which earned US\$29.1bn of profits on \$86bn on sales, the commercial platforms as Alibaba Group achieved a net income (profit) of US\$23.3bn on smaller volume of sales US\$93.8bn than Amazon generated a profit of US\$21.3bn on US\$386.1bn.

The European plans for platform extension are seen more on a local (domestic) level, and the extent to which smaller countries can succeed in obtaining key roles in the international market and hedge between US and China is still puzzling (Rolf and Schindler, 2023).

5. LEGAL STATUS OF THE ONLINE PLATFORMS, NEW TRENDS AND DEVELOPMENTS

Platform ‘users’ – individuals or legal entities enter in a variety of online medium relations contractual or extracontractual (e.g. market, social networks, media production and/or communications) from which are extracted a mass of data, codified, analysed and used in marketing (Rolf and Schindler, 2023). The platform became not only a source of commercial activities and a source of cross border accessibility of the services and / or products for clients (consumers) but also a source of data. The data become one of the main competitors for the currency, it is a more valuable one taking into account the new trends and evolutions of the markets and the desires of the clients. The giant companies work closely with online platforms or use them through collecting and processing clients’ data for future marketing and companies’ strategies, ever by reorienting companies’ business activities of by offering new products and services to fit the clients’ requirements and trends. Taking this into account and the abovementioned we strongly support the opinion of granting a ‘special statuses to online platforms. Firstly, the platforms offer possibility to meet the offer and acceptance of the offer of the consumers and hosts/owners (hosts and guests) in a secured and professional area, as for example Airbnb, Booking, Uber, Amazon and other online platforms. Secondly, usually the online platforms are offering own rules for setting the minimum requirements that offer consumers a security to sing the contracts, for example Airbnb offer legal obligations that for example arise in the relation to privacy protection also known as Host Guarantee, there are set the ‘rules of hospitality’ (e.g. accuracy, communication, availability, commitment)

(Mak, 2018). Thirdly, online platforms started to have even online preliminary solving centres of disputes as for example Airbnb's resolution centre (Mak, 2018), arbitration or mediation courts that settle the disputes that arise in online sphere, a really great experience has China in this domain.

6. CONCLUSIONS

In conclusion, it was observed that electronic platforms obtained a place in the contractual relationships. The opinions vary in this domain, some authors consider that platforms which offer as precondition of pre accession terms of reference (that are not considered contracts) are not subject of the contractual relation on the other hand others are placing platforms as key actors and subjects. In this research, we support the idea as platforms having a separate status in the contract as contractual party taking into account the role that play in the contractual relations in the online environment. Indeed, as we have demonstrated, despite the critical comments put forward in this research platform services or online commercial platforms, via innovative business models, are rapidly getting their role and place in international world economy, the famous 'sharing economy' – is a boost given to the society to consider methods of cooperation that encourage sharing.

It creates new possibilities for people to access services from many countries across the whole world, and this should encourage creating new platforms to bring new actors on the international and national online market places which will offer new and improved services and products for clients. The pandemic accelerated development of online platforms and increased their quantity, some businesses moved exclusively in the online medium, nevertheless the law should not create obstacles for such development and on the contrary to support them. By offering and delimitating the special status of the platforms would improve their legal position as subject of contractual relation and would fortify their role in intermediating contractual relations between hosts and guest, sellers and buyers and other third parties.

Finally, by mitigating the unequal position that exist between the online service providers who unilaterally control internally the code and algorithms that stay behind the main scene (desktop) of the platform and the clients consumers/clients) it will help improve the consumer framework.

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THE ROLE OF ORGANIZATIONAL CULTURE IN MANAGERIAL DECISION MAKING IN PUBLIC HOSPITAL UNITS IN ROMANIA

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Abstract

The national and global economy, as well as the health status of the population, are influenced and in turn influence hospital units. Thus, managers of public hospital units in Romania must manage the most efficient use of available resources, with beneficial effects on society. Aspects such as high quality of care at the lowest and most competitive cost, a high degree of performance, medical services similar to hospitals abroad, with the constraint of often insufficient material resources, the involvement of the political factor, uncertainties in the economic field, as well as an arsenal of rules and regulations that determine lengthy procedures, organizational culture, are factors that put pressure on managerial decision making. The interest in addressing this topic was generated by the importance of cultural elements and how they can influence the effectiveness of employees and thus the institution. We believe that the performance of hospital activity is influenced by the way the manager makes decisions as well as by the organizational culture. Therefore, considering the need to emphasize the importance of organizational culture in public hospital units in Romania that can provide the basis for the development of a theory of orientation of managerial decision-making towards performance, this article aims to: (1) review the literature in this field, (2) highlight the link between organizational culture and performance, and (3) develop the factors that influence managerial decision-making.

Keywords: *economy; organizational culture; managerial decision making; health; health system.*

JEL Classification: A10, I15, I18, M12.

1. INTRODUCTION

It is well known that managerial decisions are reflected in the functioning of hospital units and thus in the health of the population, essential for economic well-being and the basis of socio-economic development. The concern of managers to provide high-performance health services, as well as the rapid increase in expenditure in this sector, together with the growing number of requests from patients, have heightened the need to identify all the factors influencing these aspects.

Organizational culture is one of the major factors in managerial practice and decision-making. Organizational culture refers to a shared set of customs, beliefs, and practices that form the basis of communication and mutual understanding. If functions are not performed satisfactorily, culture can significantly reduce employee effectiveness. Thus, organizational culture should not only be seen in terms of its cultural elements, but also in terms of its functions and relationship to hospital unit performance.

Decision-making is one of the manager's responsibilities, and the long-term development of hospital units depends on their efficiency. Decision-making and implementation require the use of human, financial, material, and information resources that are usually scarce in public organizations. In order to make the decision-making process as efficient as possible, the decisions taken in public hospital units must be as rational as possible. Managerial decision-making in public hospitals in Romania is influenced, on the one hand, by economic and political factors, and, on the other hand, by the personality of the individuals who participate in decision-making, as well as by the personality of the organizations in which decisions are made. Awareness of the influence of organizational culture in the decision-making process in public hospitals in Romania is of major importance for management, and the financial and economic implications have a major impact on the health status of the population.

2. LITERATURE REVIEW

Organizational culture refers to shared values and norms that influence employee behavior (Schein, 2004, p. 225). This concept took shape in 1951, when Jaques Elliott, cited by Pathirana (2019), wrote about the problems of organizational culture in the manufacturing industry in England. In the early 1980s, according to Denison, cited in Denison, Haaland and Goelzer (2004), the theory of organizational culture included behavior within organizations alongside social science disciplines such as anthropology, sociology, and social psychology (Denison, Haaland and Goelzer, 2004, pp. 98 - 109). In 1982, Peters and Waterman indicated the characteristics of organizational culture in corporations for achieving high performance; the authors also ranked 46 high-performing corporations in the United States based on their organizational culture (Peters and Waterman, 1982, pp. 35 - 52).

In 1985, Schein pointed to three important parts of organizational culture in organizational performance: assumptions, artifacts, and values. Assumptions represent informal but important rules in the organization; artifacts represent the visible elements of organizational culture, including the work process, the workplace, and organizational structures; values represent the beliefs of organizational members and their business strategy. These three elements contribute to the maintenance of an effective organizational culture (Schein, 1985, pp. 67-71). On the other hand, Robbins (1986) defines organizational culture as a uniform perception of an organization that has common characteristics. Organizational culture, according to the author, is something descriptive and effectively can distinguish one organization from another. It can also integrate individuals and groups of organizational systems (Robbins, 1986, pp. 91 - 95).

In 1992, Kotter and Heskett showed a strong relationship between organizational culture and business performance in over 200 corporations in the United States (Kotter and Heskett, 1992, pp. 22 - 24). Organizational culture is also defined by Rousseau (2000) as a set of stable characteristics that show the distinguishing features of an organization and differentiate it from others. He also defines organizational culture as a set of norms and values that are shared by individuals and groups throughout the organization. These organizational values in turn form the standard norms and guidelines for the organization that make it distinct from others (Rousseau, 2000, pp. 67 - 72).

According to Azhar (2003), organizational culture is a combination of assumptions that are important to each member of an organization. Organizational culture is basically made up of two major common assumptions: values and beliefs. Values are the assumptions that have been transmitted by the leaders of the organization and are considered to be ideals that are desired by all members of an organization. On the other hand, beliefs are assumptions about reality and created by experience (Azhar, 2003, pp. 55 - 63). Later, Schein (2004) recognized this study as foundational research in the field of organizational culture, and then Schein (2010) defines organizational culture as a pattern of shared assumptions that have been accepted by a group of individuals as support to solve their problems, representing a phenomenon that is shared by members of an organization and operates unconsciously. In 2012, Flamholtz and Randle developed the field of organizational culture, i.e. its contribution to business performance with practical examples on numerous corporations in the United States, Europe, China, and other countries. Sharma and Good (2013) showed the influence of organizational culture on organizational decisions and performance. In addition to the fundamental studies mentioned above, other studies that have contributed to the development of organizational culture theory include Racelis (2010); Agbejule (2011); Eckenhofer and Ershova (2011); Ramachandran *et al.* (2011); Naranjo-Valencia *et al.* (2011); Prajogo and McDermott (2011); Gupta (2011); Ahmadi *et al.* (2012); Cerne *et al.* (2012); Singh (2013); Akhavan *et al.*

(2014); Heritage et al. (2014); Cao *et al.* (2015); Deem *et al.* (2015); Rawashdeh et al. (2015); Gambi *et al.* (2015); Asaad and Omer (2016); Chidambaranathan and Regha (2016); Willar *et al.* (2016).

3. THE IMPORTANCE OF HOSPITAL PERFORMANCE IN ROMANIA

In the 1980s, three events prompted the deepening of research into performance measurement in health care and, later, the emergence of performance management in this field; the first event was an article published in the New York Times in 1986 listing mortality rates in hospitals in the United States. Consequently, The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) launched Agenda for Change in 1987, which targeted clinical and organizational outcome measures (The New York Times Archives, March 17, 1986, p. 00018). The second set of events in this regard came in the form of publications by researcher John Wennberg, cited by Gali (2016), about large regional differences in health outcomes. The third event was a differentiation of the three aspects of health care management: structure (the available resources needed for care), process (the degree to which professionals follow the rules), and outcome (the change in a patient's health status after treatment), published by Donabedian in 1982 (Donabedian, 2003). Thus, the concept of "performance management" has been developed in health care, referring to the use of indicators to measure and improve the performance of organizations; this refers to measuring and increasing the performance of the care process, making the most efficient use of resources.

The first series of health services performance programs were implemented in the United States in the cardiology sector. In 1995, the National Committee for Quality Assurance (NCQA) launched the first (HEDIS) health plan performance reporting program in the United States, a program used in over 90% of health plans and by a number of organizations that measure performance at both the system and provider levels (Bottle and Aylin, 2017, pp. 42 - 44).

According to Armstrong and Baron (1998), healthcare facility performance is a strategic and integrated approach to ensuring success by improving employee performance and developing the capabilities of teams and individual contributors. Reynolds and Ablett (1998) argue that people and not capital provide organizations with a competitive advantage. The goal of performance management is to transform the raw potential of human resources into performance by removing intermediate barriers as well as motivating human resources (Kandula, 2006, p. 55).

The use of performance indicators in public hospital units can trigger a wide range of improvement activities. However, it is important for the organization to focus on the areas that need the most improvement, as each organization has different needs and needs to identify and prioritize its own pressure points.

Diagnosis Related Groups - DRGs are a way of assessing the performance of public health systems. The Diagnosis Related Groups (DRG) system was developed in the 1970s at Yale University in the USA by a group of physicians, economists, and statisticians, with the material support of the former Health Care Financing Administration (HCFA), who wanted to design a system for evaluating hospital performance. The DRG system shifts the paradigm of a hospital's operation from the level of resources and the process carried out to the results of activities, reflected in the health status of patients treated by the hospital unit. Thus, the DRG system takes a "snapshot" of hospital performance; it was originally developed to evaluate hospital outcomes but has been taken up and adapted for use in evaluating the efficiency of health sector financing (Busse *et al.*, 2013, p. 4). Authors who have studied the efficiency of health system financing using DRGs include Wennbero *et al.* (1984), Brizioli *et al.* (1996), Menke *et al.* (1997), Vinod *et al.* (2001), Chuang *et al.* (2003), Schreyögg *et al.* (2006), Peltola and Quentin (2013), Shoukri *et al.* (2019).

In Romania, according to the rules in force in the E.U., the performance indicators of hospital units are grouped into (1) Human resources management indicators; (2) Service utilization indicators; (3) Economic-financial indicators; (4) Quality indicators; (5) Patient safety indicators; (6) Patient satisfaction and transparency indicators (Ministry of Health, Order no. 730/ 2018).

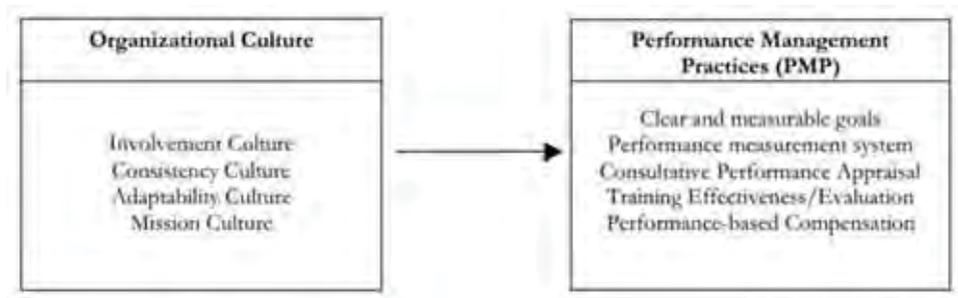
4. THE RELATIONSHIP BETWEEN ORGANIZATIONAL CULTURE AND PERFORMANCE MANAGEMENT

The level of involvement of organisational culture in the management of organisations must be high and lead to organisational performance; as managers or people with influence in the organisation will always dictate the organisational culture, emphasizing what is important or not in an organisation and how the organisation should be understood, we can state that this type of culture is closely related to performance management.

One of the key elements in achieving performance is developing a strong organisational culture. At the same time, a poorly developed organisational culture can become an obstacle to implementing new strategies (Alvesson, 1990, p. 12). The culture of a public hospital institution cannot be ignored when it comes to concepts such as risk, patient relationship management, and change management. Thus, a strong organisational culture is one in which employees work together effectively, share the same core values, and make decisions to meet key objectives that are reflected in people's health.

According to Kandula (2006), the key to good performance is a strong organizational culture. Because of the difference in organizational culture, the same strategies do not yield the same results in two organizations in the same industry and in the same location. A positive and strong culture can make a regular employee's performance, while a negative and weak culture can demotivate an

outstanding employee and drive performance. Therefore, organizational culture plays an active and direct role in performance management. Murphy and Cleveland (1995) believe that culture research will contribute to the understanding of performance management. Martin (2002) argues that without considering the impact of organisational culture, organisational practices such as performance management could be counterproductive as the two are interdependent and change in one will affect the other. Figure 1 shows the cultural traits of commitment, consistency, adaptability, and mission in organizations that exert a significantly positive influence on performance management practices.



Source: Denison and Mishra (1995)

Figure 1. A conceptual model of organization culture and performance management practices

5. FACTORS INFLUENCING MANAGERIAL DECISION-MAKING

Managerial decision-making requires continual refinement of knowledge of the formal analytical techniques, behaviors, personal characteristics, and power politics that influence the making of each decision (Duane and Chet, 2004, p. 8). Decision-making is also influenced by the environment to which decision-makers relate; the external environment, which includes all elements that are present in the external world of individuals, can interact with them and influence their behavior (March, 2004, p. 67).

Analyzing managerial decisions and starting from the idea that managers want to make the best decision in the best interest of the organization, Robbins and Coulter (2011) consider decision-making as a multilateral whole that can be approached from several perspectives. The factors that influence managerial decision-making are (1) the type of problem that exists, (2) the decision-making approach, (3) managerial style, and (4) the conditions of decision-making. Each factor participates in determining how the manager makes a decision (Robbins and Coulter, 2011, p. 192). Decision-making is also influenced by several factors that are related to the manager's personality and the external or internal environment of the organization, both of which distort the perception of the

problem and lead to solutions that may not always be ideal (Alvino and Franco, 2017). Decision-making is the main activity of managers in all types of organizations and at all levels, summarizing the behavior of managers and clearly distinguishing managers from other occupations in society.

Similar studies in the literature, such as the one by Szymaniec-Mlicka (2017), show that hospital managers' decisions in European countries such as Poland are dependent on the political environment. Equally, Olivier (2005) has pointed out that politics plays an essential role in health issues and that it is essential for public health managers to understand the political dimensions of problems and proposed solutions (Kidholm *et al.*, 2015). Influencing factors of managerial decision: external environmental factors - the political factor, the economic factor, and to a much lesser extent, the social factor and the geographical factor and internal environmental factors: values and ethical dilemmas.

Russell-Jones (2000) discusses the existence of errors or weaknesses in the decision-making process. These are (1) haste - not to be confused with speed. The decision is made before the data is available or without regard to the facts; (2) narrow perspective - often results in the wrong approach to the problem because the real problem has been pre-judged or limited in an inappropriate analytical framework; (3) overconfidence - either in the decision itself or, more commonly, in the understanding of the problem and the facts; (4) performing a superficial analysis for important decisions rather than a proper analysis; (5) lack of analytical framework and trying to manage many variables or information.

To avoid errors in the decision-making process, managers should follow a few rules. First of all, they must take into account cultural differences, taking account the values, beliefs, attitudes, and behavior patterns of the people involved. Secondly, decision-makers need to know when to quit. Negative information is blocked or distorted by most managers because they refuse to believe that they have not made a good decision, becoming so attached to a decision that they do not recognize its failure. Thirdly, managers need to build an organisation that can constantly adapt to a changing environment. Fourth, decision-makers must adopt a coherent decision-making model that focuses on what is important, is logical and consistent, recognizes subjective and objective thinking and combines analytical and intuitive thinking, requires only as much information and analysis as is necessary to resolve a given dilemma, encourages and guides the gathering of relevant information, and keeps informed advice simple, reliable, user-friendly and flexible.

6. CONCLUSIONS

In addition to formal organizational structure and standard operating rules and procedures, organizations also rely heavily on their organizational culture as an important tool in controlling and coordinating the activities of their members, providing them with the motivation to act in the ways that the organization's

managers deem necessary to achieve and sustain organizational effectiveness and performance. Broadly speaking, organisational culture is the totality of a company's values, attitudes, norms, and beliefs that control the interactions of its members. Thus, the main source of organisational culture is the people who work in the organisation. Interactions between people with different values, personalities, and ethics ultimately create a unique organisational culture, distinct from that of other similar companies.

In Romania, organizational culture is a relatively new concept, with few organizations knowing the meaning of this term and the relationship between organizational culture and long-term organizational performance. In this context, not many studies on organizational culture have been carried out, and those that do exist do not have national relevance, either because they have focused on only one organization or because a representative sample was not chosen.

Hospital regulations are the main sources of information on the organisational values promoted. An important role is also played by the website, brochures, and various meetings and training, which means that formal sources are basic in informing staff.

In a corporate group, organizational culture can be considered an essential ingredient of organizational performance and a source of sustainable competitive advantage. This paper has presented a synthesis of various reputable literature on the role of organizational culture on business performance from a corporate group perspective. It was found that organizational culture has a strong impact on organizational performance. Empirical evidence also showed that lack of cultural integration among member companies was a leading cause of failure in corporate groups. Therefore, it is found that cultural improvement would result in increased performance. Therefore, how establishing an effective organizational culture to improve corporate performance can be recognized as a necessary research area. In addition, this paper has highlighted the prevailing theoretical and empirical gaps in the field of organizational culture towards corporate performance and therefore the findings may be useful for similar future studies. More research can be done in this area to determine the nature and capability of organizational culture in manipulating corporate performance.

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GOVERNMENT EXPENDITURE ON ENVIRONMENTAL
PROTECTION AND ENVIRONMENTAL PERFORMANCE.
EVIDENCE FROM EU COUNTRIES

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Abstract

During the last few years, environmental protection has become a much-debated topic at international, continental, and national level. The necessity of a green recovery is justified because such as COVID-19 virus had spread across borders, in the same way, the impact of climate change will be felt across the world. Thus, a green recovery is much needed based on policies that will simultaneously support economic recovery and environmental protection through investments in green projects. In this context, in December 2019, European Union (EU) launched the European Green Deal (EGD). In accordance with the EU's environmental policies, one of the EGD goals is for Europe to become the world's first 'climate-neutral' region, with net zero GHG emissions by 2050.

As a result, every EU member state has to make efforts to first accomplish this objective at national level. In this article, we want to investigate if, at this time, the EU member states and their governments allocate more funds and spend more money for environmental protection. Furthermore, we will investigate if there is a correlation between the government expenditure on environmental protection and environmental performance, measured according to the environmental performance index (EPI). For this purpose, we will apply the sigma-convergence approach to highlight the evolution over time of the cross-national dispersion in environmental spending for the period 2012-2021. Also, we want to identify if there is correlation between governmental expenditure and EPI. The results show that countries with higher government expenditure on environmental protection recorded a higher environmental performance index (EPI).

Keywords: *government expenditure on environmental protection; environmental protection; environmental performance index; sustainable development.*

JEL Classification: H50, N50, Q58.

1. INTRODUCTION

Preventing further environmental deterioration and slowing down climate change is one of the most pressing global issues of this century. Thus, present and future economic development must be supported by sound, robust, viable and efficient environmental sustainability policy that should channel public expenditures and encourage green investments because having a carbon free economy takes money and lots of it. The effectiveness and efficiency of spending such money on environmental protection are key to success.

During the last ten years, the European Union has improved its environmental protection policy, implementing different measures to achieve the development of a climate-neutral economy. Member States were urged to adjust their national environmental strategies and programs according to the EU environmental policy, to diminish discrepancies between them and to act together towards uniformity.

In December 2019, EU announced its climate-neutral growth strategy based on a set of political initiatives called EU Green Deal (European Parliament, 2021), which “provide the right policy tools for the transition towards environmentally sustainable businesses in Europe, while recovering from COVID-19 pandemic” (Dornean and Popescu, 2021, p. 411).

COVID-19 generated millions of tons of plastic waste because the use of facemasks, plastic food containers, and protective equipment (Wolf *et al.*, 2022) that needed recycling, which meant more pollution and greenhouse gas emissions (GHGs). Thus, during the 2021 Glasgow Climate Summit, the global community established a target of net-zero greenhouse gas emissions by 2050 and committed to more ambitious climate policies in pursuit of this goal.

The paper is structured in five sections as follows: the next section reviews the literature regarding the issue of environmental protection, in particular, the environmental protection expenditure and also the relationship between this type of public expenditure and environmental performance. Section 3 presents sample, data and methodology used in the present study. Section 4 illustrates and discuss the results. Finally, section 5 concludes the paper.

2. LITERATURE REVIEW

Eurostat, the statistical office of the EU, defines environmental protection expenditure as “the money spent on all activities directly aimed at the prevention, reduction and elimination of pollution or nuisances resulting from the production processes or consumption of goods and services” (Eurostat, 2016).

The efficiency of government expenditure on environmental protection is an important issue for achieving environmental protection and an important

determining factor for environmental quality (Halkos and Paizanos, 2013; Zhang *et al.*, 2019; Chang *et al.*, 2019).

A review of the literature in the field reveals an important number of studies which focused on China (Cheng and Chen, 2017; Zhang *et al.*, 2017; Wang, 2018; Zhang *et al.*, 2019; Jialu *et al.*, 2022; Tang *et al.*, 2022). The importance of environmental protection expenditure in China increased since the rapid development of China's economy which has been accompanied by various environmental problems. According to the 2022 EPI (Wolf *et al.*, 2022), China ranks the position 160 out of 180 countries and is the largest contributor to global carbon dioxide emissions.

In this context, we can mention the paper of Zhang *et al.* (2017), that investigated the relationship between the share of government expenditure over GDP and pollutant emissions with the objective to find the influence of the relative scale of government expenditure on environmental quality. The authors used the panel data of 106 Chinese cities for the 2002-2014 period and they found that the proportion of government expenditure does have a significant effect, but different, on pollutant emissions, namely: the estimated total effect of government expenditure is negative for sulfur dioxide (SO₂) and soot and chemical oxygen demand (COD), while it is positive for soot after GDP per capita reaching 7500 dollars. Also, the results obtained by Zhang *et al.* (2017) indicated that in a period of economic growth, the increase of GDP per capita was accompanied by a decrease of the SO₂ and soot emissions and an increase of the COD.

Furthermore, Wang (2018) analyzed the efficiency of public environmental expenditure using Data Envelopment Analysis (DEA)-Tobit Model for Central China over the period 2007-2015. The results of his study showed that government expenditure on environmental protection is inefficient, except for Hubei Province in Central China. Moreover, there are large differences among provinces in a different stage of scale return. From other perspective, the GDP per capita has a significant positive impact on the efficiency of fiscal expenditure on environmental protection, results which are in line with those obtained by Zhang *et al.* (2017).

Another paper examined the efficiency of government expenditure on environmental protection for China (Zhang *et al.*, 2019), using spatial econometric models on panel data of 30 provincial-level administrative regions in China over the period 2007-2016. Their conclusions highlighted three important results: first, the efficiency of government spending increased during the analyzed period; secondly, FDI is positively correlated with the efficiency of government environmental expenditure in terms of both quantity and quality of spending and it has a positive spillover effect; thirdly, financial decentralization is negatively correlated with the efficiency of environmental spending, but it improves the effect of FDI.

Other studies had investigated the impact of government expenditure on environmental protection on the economic growth (measured by GDP) of different countries. In this context, Krajewski (2016) conducted a study for eleven countries of Central Europe (Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia) in order to analyze the impact of public environmental protection expenditure on economic growth. Krajewski (2016) used an econometric panel model for the period 2001-2012 and his results revealed that the increase in public environmental protection expenditure has a positive effect on economic growth. A recent study (Levytska and Romanova, 2020) arrived to the same conclusion as Krajewski (2016). In their paper, Levytska and Romanova (2020) demonstrated that an increase of public environmental protection expenditure by 0.01% generated an increase of GDP by 0.36%. Their study was applied for Ukraine for a period of 18 years (2000-2017) and their results suggest that higher environmental expenditures in Ukraine can improve both environmental and economic situation.

Chang *et al.* (2019) conducted a comprehensive study regarding the impact of government expenditure on environmental protection among Asian countries. They have chosen to analyze Asia because it is the largest continent in the world in terms of both landmass size and population, and also because of the environmental pollution problems that Asia has been facing in tandem with the economic development. They analyzed 18 Asian countries from 2005 to 2014 and they obtained three important findings: first, higher environmental government expenditure generated a reduction of CO₂ emission and energy efficiency; secondly, excessive economic growth is detrimental to the environment, and increasing GDP per capita leads to increasing CO₂ emission, decreasing energy efficiency, and decreasing environmental performance; thirdly, FDI exerts a significantly negative impact on energy intensity and consequently on energy efficiency. To compare, Chang *et al.* (2019) included in their sample also 26 European countries covering the period 2008–2013. For these countries the impact was insignificant.

Contrary to Chang *et al.* (2019), Barell *et al.* (2021) demonstrated that higher environmental protection expenditures did not result in better environmental results. Barell *et al.* (2021) applied DEA methodology for the period 2005-2015 and their results revealed that Finland is the most effective in environmental protection, among the 30 analyzed countries (27 EU member countries, Switzerland, United Kingdom and Iceland).

One of the first empirical contributions to the academic debate on the efficiency of environmental expenditures in the European Union countries is the study of Ercolano and Romano (2018). They examined the correlation between the size and composition of public environmental expenditures and selected environmental performances and results. Ercolano and Romano (2018) identified

no significant bivariate correlation between EPI, public environmental expenditures in terms of GDP and GDP per capita.

Analyses dedicated to the level of environmental expenditures were conducted for OECD countries by Le Gallo and Ndiaye (2021). Using data from 1995-2017 on a sample of 28 OECD countries, Le Gallo and Ndiaye (2021) obtained that OECD countries consider their neighbors' behavior when making policy choices related to environmental expenditures which means that countries increased environmental expenditure as a response to the increase of environmental expenditure of their neighbors.

Thus, it is necessary to improve the efficiency of public environmental expenditure. Latif (2022) proposed a Comprehensive Environmental Performance Indicator (CEPI) using a composite index for 48 Asian economies, using six causal variables (Ecological Footprints Index (EFPI), Environmental quality index (EQI), Environmental vulnerability Index (EVLI), Environmental Sustainability Index (ESI), Adjusted Net Savings Index (ANSI), Pressure on Nature Index (PONI)) as determinants of environmental performance for the period 1996–2020. The index is useful for explaining the determinants of environmental performance and its contribution to economic growth and development. According to CEPI, the developed Asian economies presented better environmental performance compared to the low-income Asian economies.

The 2022 EPI (Wolf *et al.*, 2022) revealed that countries with the highest environmental quality are generally located in Europe (Australia being the exception). In particular, Denmark, United Kingdom and Finland are the top three, and most countries with the worst environmental performance are located in Africa and Asia, with India, Myanmar and Viet Nam making up the bottom three.

Resuming, studies proved that the efficiency of expenditures for environmental protection varies around the world. In some cases, environmental expenditures are direct proportional with the reduction of carbon emissions, while in other cases their efficiency fluctuates significantly because of their weak effectiveness. However, some European countries, including EU Member States, made good progress in protecting the environment as their environmental expenditures proved to be efficient.

3. METHODOLOGY AND DATA

3.1. Sample and methodology

For achieving our purpose, we have selected all the 27 EU countries, namely: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.

We use a sigma-convergence approach in order to investigate the evolution of the cross-national dispersion of government expenditure for environmental protection for the period 2012-2021.

Furthermore, we want to examine the correlation between government expenditure for environmental protection and Environmental Performance Index (EPI) for the analyzed period.

3.2. Data and descriptive statistics

All data for government expenditure for environmental protection were collected from Eurostat, for period 2012-2021, while the data for Environmental Performance Index (EPI) were collected from the web page dedicated to Environmental Performance Index (<https://epi.yale.edu/>). Since 2022, EPI is the most comprehensive global environmental indicator that leverages 40 performance indicators grouped into 11 issue categories, which are aggregated into three policy objectives: Environmental Health, Ecosystem Vitality, and Climate Change (Wolf *et al.*, 2022).

The descriptive statistics for the two selected variables are presented in Table 1. At a first glance, it can be observed that both variables increased during selected period (exception Portugal for which EPI decreased with 1.6). Regarding the government expenditure for environmental protection, the highest increase was recorded for Germany (7,460 mill. EURO), France (4,690 mill. EURO) and Italy (3,156 mill. EURO). At the same time, for the same period, the highest increase of EPI was recorded for Malta (25.40), Finland (21.00) and Croatia (17.20). Even so, EU expenditures on environmental protection remained relatively stable, ranging between 0.7% of GDP and 0.9% of GDP. Its share in total expenditure also remained relatively stable, varying between 1.4% and 1.7% of total expenditure (Eurostat, 2023b).

Table 1. Descriptive statistics

Country	General government expenditure for environmental protection period 2012-2021 (million euro) ^a				Environmental Performance Index (EPI) ^b		
	Average	Min	Max	Increase 2021 vs 2012	EPI 2012	EPI 2022	EPI (10 years change)
Austria	1,491	1,324	1,751	227	59.30	66.50	7.20
Belgium	5,914	5,059	6,755	1,076	52.10	58.20	6.10
Bulgaria	381	289	559	288	47.30	51.90	4.60
Croatia	483	258	868	687	43.00	60.20	17.20
Cyprus	59	44	90	54	52.00	58.00	6.00

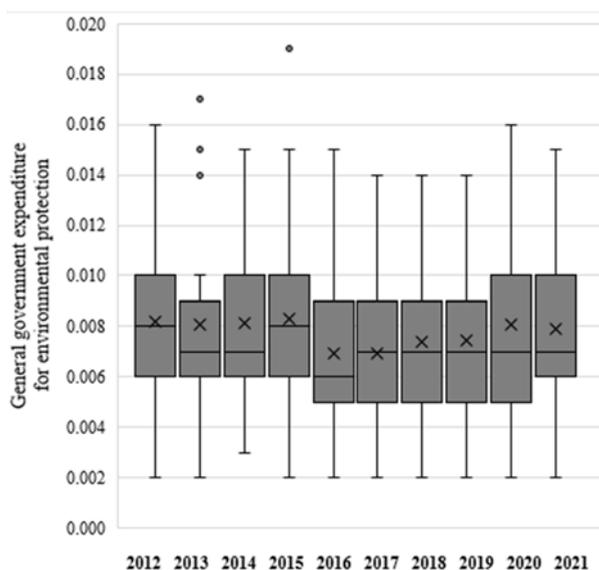
Country	General government expenditure for environmental protection period 2012-2021 (million euro) ^a				Environmental Performance Index (EPI) ^b		
	Average	Min	Max	Increase 2021 vs 2012	EPI 2012	EPI 2022	EPI (10 years change)
Czech Republic	1,803	1,329	2,220	151	54.70	59.90	5.20
Denmark	1,187	1,018	1,259	283	63.00	77.90	14.90
Estonia	161	126	193	13	55.30	61.40	6.10
Finland	503	453	579	182	55.50	76.50	21.00
France	22,635	21,009	26,013	4,690	56.10	62.50	6.40
Germany	18,479	15,741	23,107	7,460	60.20	62.40	2.20
Greece	2,537	2,092	3,058	263	51.90	56.20	4.30
Hungary	964	576	1,341	400	53.10	55.10	2.00
Ireland	1,264	1,041	1,483	312	54.90	57.40	2.50
Italy	15,355	13,962	16,968	3,156	51.70	57.70	6.00
Latvia	162	135	188	17	52.90	61.10	8.20
Lithuania	238	187	300	24	52.70	55.90	3.20
Luxembourg	487	361	668	443	58.80	72.30	13.50
Malta	149	109	195	104	49.80	75.20	25.40
Netherlands	10,445	9,320	11,938	2,628	56.70	62.60	5.90
Poland	2,489	1,783	3,224	1,122	50.60	50.60	0.00
Portugal	1,222	1,031	1,721	714	52.00	50.40	-1.60
Romania	1,324	934	1,679	434	50.70	56.00	5.30
Slovakia	718	597	929	411	56.80	60.00	3.20
Slovenia	291	194	404	100	58.70	67.30	8.60
Spain	10,288	9,105	12,194	2,165	49.30	56.60	7.30
Sweden	2,251	1,936	3,017	1,316	56.90	72.70	15.80

Source: ^a – authors' calculation, based on Eurostat (2023a)

^b – authors' calculation, based on EPI (2023)

4. RESULTS AND DISCUSSION

In Figure 1, we illustrate ten box plots built, by using cross-country yearly data for period 2012-2021, regarding general government expenditure for environmental protection as % from GDP.

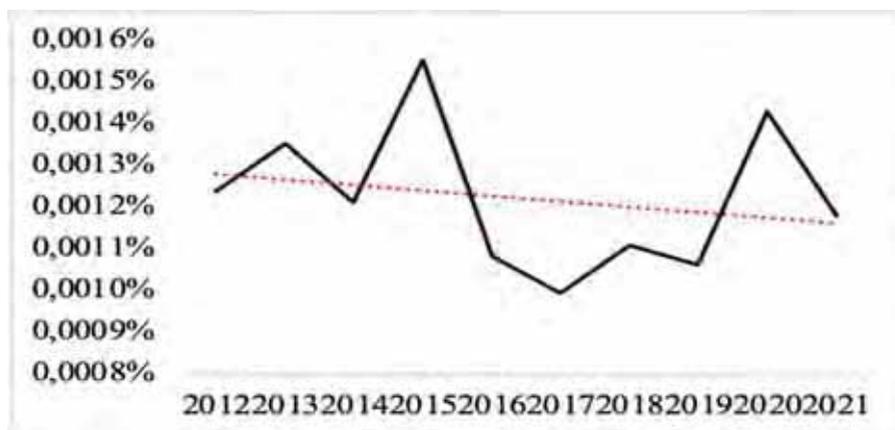


Source: authors' calculation, based on Eurostat database (2023a)

Figure 1. General government expenditure for environmental protection in EU countries (% GDP)

We can observe that the median value of public expenditure for the environment slightly decreased over the period 2012-2021.

Overall, we can say that the expenditures allocated for environmental protection by UE countries remained relatively high during the analyzed period, even if the increase of this category varies across countries. However, in Figure 1 and Figure 2, we can identify that cross-country variability in public expenditure for environmental protection decreased slightly over the period 2012-2021. This evolution highlights that EU countries have different policies regarding environmental protection, as we are able to see from table 1. We are able to identify countries as Germany, France and Italy which increased the yearly spending in average with more than 300 million euro for analyzed period, while on the opposite side, there are countries as Cyprus, Estonia, Latvia, Lithuania, Slovenia which increased the yearly spending in average with less than 10 million euro for the same period. Of course, the explanation regarding this variation across EU countries is based on different levels of economic development, which means that the more developed countries can allocate more for environmental protection compared to the less developed countries.



Source: authors' calculation, based on Eurostat database (2023a)

Figure 2. Coefficient of variation calculated on yearly cross-national data of general government expenditure for environmental protection (% GDP) by year

Next step is to analyze the correlation between governmental expenditure and EPI (Table 2). The interesting fact is that at the beginning of the period in 2012, there is recorded a positive correlation between these two analyzed variables, while at the end of the period the correlation becomes negative (even if the values is slow). Despite this, if we take into account the average values for the entire period, it looks that between governmental expenditure for environmental protection and EPI exists a positive correlation.

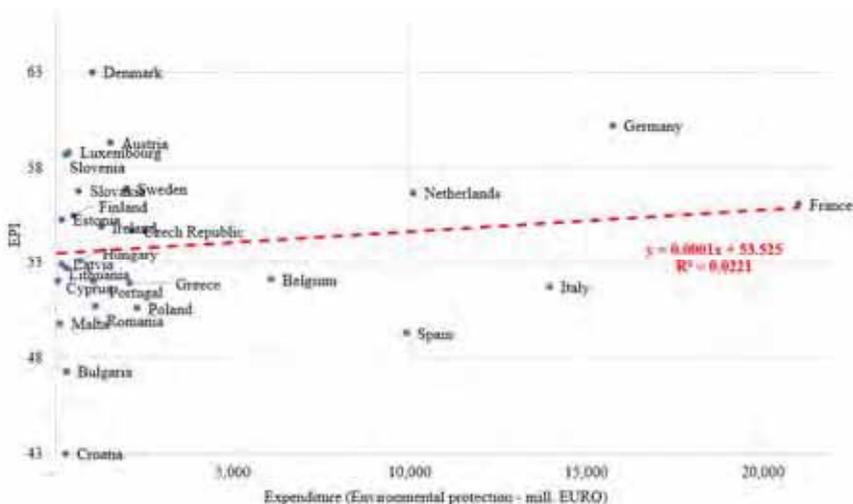
Table 2. Correlation coefficients between governmental expenditure and EPI

Period	Correlation
2012	0.1486
2022 ^a	-0.0775
AVG 2012 - 2022 ^b	0.0044

Source: ^a – Due to data availability we consider EPI for 2022 and government expenditure for environmental protection for 2021 (EPI, 2023; Eurostat, 2023a)

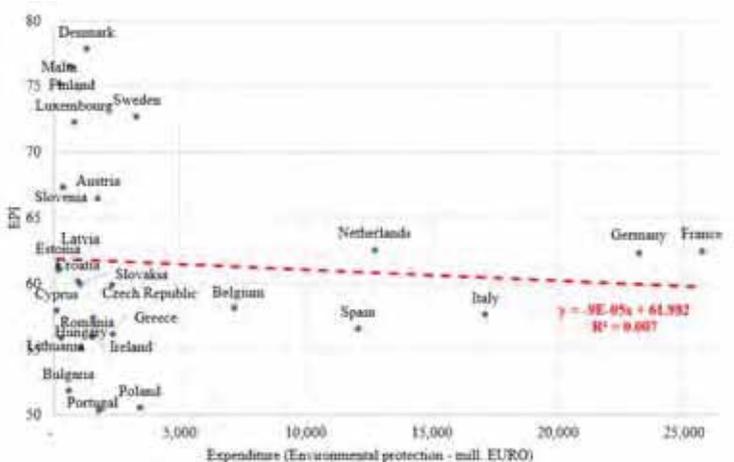
^b – Average for government expenditure for environmental protection is calculated based on values for period 2021-2021, while the average for EPI is calculated for 2012 and 2022 (EPI, 2023; Eurostat, 2023a)

The same trend can be seen in Figures 3, 4 and 5, in which we had represented scatter plot reporting EPI and general government expenditure for environmental protection in 2012, 2021/2022 and the average for the entire analyzed period.



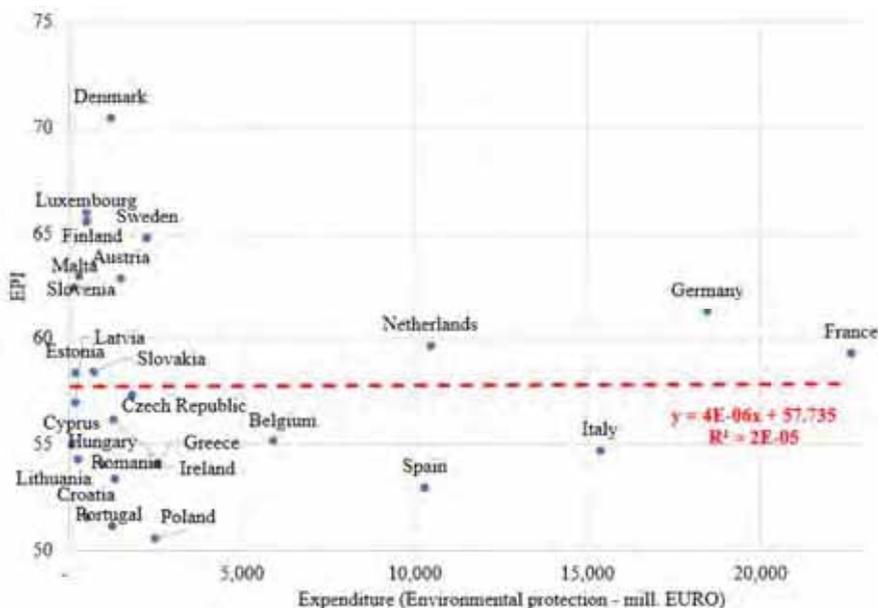
Source: authors' calculation, based on Eurostat database (2023a) and EPI database (2023)

Figure 3. Scatter plot reporting EPI and general government expenditure for environmental protection in 2012



Source: authors' calculation, based on Eurostat database (2023a) and EPI database (2023)

Figure 4. Scatter plot reporting EPI and general government expenditure for environmental protection for 2021/2022



Source: authors' calculation, based on Eurostat database (2023a) and EPI database (2023)

Figure 5. Scatter plot reporting EPI and general government expenditure for environmental protection for the period 2012-2022 (average)

5. CONCLUSIONS

This paper investigated the link between general government expenditure for environmental protection and EPI. Using data for the period between 2012 and 2022, we found that during this time, there was a shift in the correlation between these two indicators, respectively from a positive correlation recorded at the beginning of period to a negative correlation at the end of the period. Despite this, overall, for the entire period the correlation between EPI and general government expenditure for environmental protection remains positive. Thus, if EU countries want to accomplish the objective of EGD, and to become the world's first 'climate-neutral' region, with net zero GHGs emissions by 2050, they have to continue their effort in this direction.

Furthermore, analyzing the evolution of government expenditure for environmental protection for EU countries, we found that there is not a common direction in this respect, on the contrary, there are many divergent ones. We were able to identify countries such as Germany, France and Italy which increased the yearly spending in average with more than 300 million euro over the analyzed period, while on the opposite side, there are countries like Cyprus, Estonia, Latvia, Lithuania, Slovenia which increased the yearly spending in average with less than 10 million euro during the same period.

Our paper contributes to the literature in the field by empirically analyzing the efficacy of government spending for environmental protection, even if we are aware of the limitation of our research, using only EPI as indicator of environmental performance.

In the future, our analysis can be extended further in order to investigate not only the level of the government expenditure on environmental protection, but also the different composition of this expenditures according to the international classification of the functions of government (COFOG) (expenditure for waste management, expenditure for waste-water management, expenditure for pollution abatement, expenditure for protection of biodiversity and landscape, expenditure for research and development, other type of expenditure for environmental protection not elsewhere classified) and how these are correlated to different indicators that measure environmental performance.

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BEYOND THE NUMBERS: A BIBLIOMETRIC ANALYSIS OF NON-FINANCIAL INFORMATION PRACTICES

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Abstract

Companies whose core business contributes to social grievances or impacts the environment, put their reputation, bottom line, and stock market value at risk, and in extreme cases even threaten their very existence. Studies have shown that environmental and social issues are now significant "non-financial" aspects with an impact on a company value. Dialogue with stakeholders to achieve or improve sustainability performance is an increasingly important factor affecting the risk-opportunity constellation and influencing access to capital and the cost of capital. Therefore, transparency on sustainability factors is increasingly emerging as a success factor in corporate finance. There are different terms around corporate responsibility: Corporate Sustainability (CS), Corporate Social Responsibility (CSR), Corporate Sustainability Reporting (CSR-D), Corporate Citizenship (CC), Environment Social and Governance (ESG), Corporate Social Initiatives (CSI), or simply non-financial (NF). In the absence of internationally uniform definitions, there are even more interpretations of what they entail. A directive of the European Union from June 2022 regarding corporate sustainability reporting obligations might lead to a more standardized way of non-financial reporting methods internationally. This study explores the question of what the above-mentioned concepts mean in terms of content, how they differ and where the respective focal points lie. The aim is therefore to identify the scientific literature indexed in Scopus with the help of a bibliometric analysis as well as to analyze it to identify the most important topics and their weighting on economic sustainability. Another objective is to understand the conceptual structure of the different concepts and to identify the knowledge base for their use in core economic business, i.e., to determine how they are currently used. The originality of this research is that our approach is unique now and the assimilation of the above concepts is a very clear sign of manifestation for sustainable business.

Keywords: *sustainability; corporate social responsibility.*

JEL Classification: M41.

1. INTRODUCTION

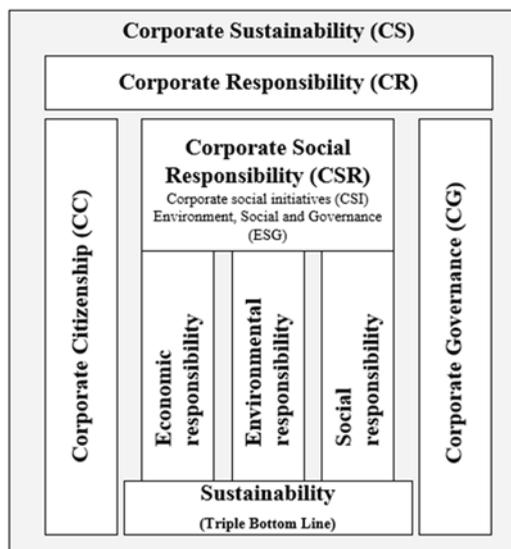
Businesses collect data to gain more insights into their operational performance, revenue, customer service, and audience demographics. To do this, they collect data to obtain information about internal or external processes. Effective data collection includes - in addition to analyzing the existing processes of the company (internal world) and stakeholder relationships (external world) - an understanding of how changes affect the company in general. The collection of data helps to optimize the internal processes and to make the best choice of the executing units, human or machine, to support them. The procedure described primarily concerns financial information (FI), which is structured and presented in an easily understandable form to make accounting statements comparable. The basis for this is various accounting standards, including those with a national reference, e.g., for Germany the German Commercial Code (HGB) and the German Accounting Standards (DRS), or with international importance the International Financial Reporting Standards (IFRS) of the International Accounting Standards Board (IASB) also the US -American accounting principles (United States Generally Accepted Accounting Principles, US-GAAP) of the Financial Accounting Standards Board (FASB). But how can companies evaluate the performance of other corporate functions, e.g., their organizational culture or governance? By collecting and analyzing non-financial data.

Non-financial information (NFI) has recently become a key concern for business leaders, investors, consumers, and regulators (Tarquinio and Posadas, 2020). Capital market participants increasingly attach importance to such information because this information is relevant for assessing a company's long-term prospects for success (Shevlin, 1996; Robb, Single and Zargeski, 2001; Flöstrand and Ström, 2006; Arvidsson, 2011). Investors, regulators, and banks are seeking greater standardization to promote accountability and incorporate non-financial factors into ratings, regulations, and lending arrangements. The transparency of sustainability factors is increasingly proving to be a success factor in corporate financing because they influence access to capital and the cost of capital. And the increasing global focus on climate change, diversity and inclusion, and the Covid-19 crisis have accelerated this momentum.

This article addresses the questions of (a) what NFIs are specifically, (b) which concepts exist, what they mean in terms of content, how they differ, where the focus is, (c) which are the most important topics (and their weighting) that are covered by NFI, and (d) whether there are country-specific peculiarities in the application. Section 2 lays the theoretical foundations for this. Section 3 addresses the research methodology and materials used. Section 4 presents the results of the data analysis, and the article ends with a summary in Section 5.

2. BACKGROUND

Corporate Responsibility (CR): The basis of CR is the so-called three-pillar model (Elkington, 1998; Norman and MacDonald, 2004; Adams, Frost and Webber, 2013), according to which economy, ecology and social issues are given equal priority and weight, both at macroeconomic and political level, as well as at global and corporate level (Figure 1).



Source: contribution of the authors

Figure 1. The concept of non-financial information

The term CR stands for the entire corporate responsibility, i.e., for any influence that the company's activities - at the core or through additional activities - have on society and the environment. Other concepts are associated with CR. *Corporate Citizenship (CC)* is the systematic civic and social engagement of companies (Valor, 2005; Mirvis and Googins, 2006). This includes, for example, donations, sponsorship, and foundation activities, i.e., additional activities that have nothing to do with the core business of a company. *Corporate Social Responsibility (CSR)* refers to the social and ecological dimensions of the core business, considering profitability as a marginal or secondary condition (WBCSD, 2002; Lindgreen and Swaen, 2010). CSR is about how profits are generated (namely, environmentally friendly, socially, and ethically responsible and at the same time economically successful) and not what happens to profits. *Corporate social initiatives (CSI)* and *Environment, Social and Governance (ESG)* are part of CSR. CSI refers to a company's financial and non-cash contributions, beyond its commercial activities, to disadvantaged communities and individuals for the

purposes of social betterment and well-being (Hess, Rogovsky and Dunfee, 2002; Bode, Singh and Rogan, 2015). ESG is a framework that helps stakeholders understand how an organization manages risks and opportunities related to environmental, social and governance criteria and is commonly used in the context of investment and financial performance (Xie *et al.*, 2019; Huang, 2021). *Corporate Sustainability* (CS) is more comprehensive, integrating all three dimensions of the three-pillar model into one unit: all products and services serve a sustainable way of doing business and living (Montiel and Delgado-Ceballos, 2014; Ashrafi *et al.*, 2018), which is currently rare. There are also points of contact with *Corporate Governance* (CG), which is understood to mean transparent and good (internal) corporate governance (Shleifer and Vishny, 1997; Bhagat and Bolton, 2019).

Non-financial information (NFI). Despite its increasing popularity in science and practice, the term NFI is not clearly defined, so there is no generally accepted definition (Eccles, Serafeim and Krzus, 2011; Erkens, Paugam and Stolowy, 2015; Haller, Link and Groß, 2017). In some studies, (Upton, 2001; Robb, Single and Zarzeski, 2001; Amir, Lev and Sougiannis, 2003; Flöstrand, 2006) the definition of NFI focuses on the location of the information, i.e., whether such information is located inside or outside the financial statements. Other studies (Amir and Lev, 1996; Barker and Imam, 2008) focus on the type of information (information drawn from outside the financial statements). It is important to clearly distinguish between disclosures within and outside the financial statements. We therefore follow the definition of Erkens in this study and define NFI “*as disclosure provided to outsiders of the organization on dimensions of performance other than the traditional assessment of financial performance from the shareholders and debt-holders’ viewpoint.*” (Erkens, Paugam and Stolowy, 2015).

Non-financial reporting (NFR). Put simply, the NFR is “*a form of transparency reporting whereby companies officially disclose certain information not related to their finances, i.e., information on social, environmental, and intangible activities and performance*” (NFI) (NAP, 2016). NFIs are - in contrast to FIs - far less subject to an established set of rules, the scope is therefore less restrictive and gives companies enormous leeway in what is ultimately reported (Erkens, Paugam and Stolowy, 2015). Initially as additional and voluntary information to the financial statements (Robb, Single and Zarzeski, 2001), reporting became mandatory for large public interest entities (PIEs) with EU Directive 2014/95/EU (EU, 2014). With the submission of the EU directive on sustainability reporting (EU, 2021), more companies will be required to report from 2024 - with transition periods. The source of the NFR lies in the consequences of abuses, especially in the environmental area (e.g. Chernobyl or Schweizerhalle, 1986). This led to stricter environmental laws and requirements in terms of occupational safety and occupational health and safety for companies

(Bougoin, 2016). In 1999, the Global Reporting Initiative (GRI) presented the first standard for NFRs, while individual industries created their own standards (e.g., European Chemical Industry Council (Cefic, 2023) for chemistry or the Cement Sustainability Initiative (CSI) of the World Business Council for Sustainable Development (WBCSD, 2023) for the cement industry). Today there are many different standards, frameworks, and guidelines for the NFR (Tarquinio and Posadas, 2020).

3. METHODS AND MATERIAL

To provide a comprehensive overview of the existing literature on the selected topic, both (a) literature analysis in a lightweight form (keyword-based search, narrowing down using selection criteria, backward and forward search) and (b) descriptive and bibliometric analysis are carried out. We agree that a literature review is "a systematic, explicit, and reproducible method for identifying, evaluating, and synthesizing the existing body of completed and recorded work produced by researchers, scholars, and practitioners" (Fink, 2019). Descriptive analysis is a preliminary stage of data processing that produces a summary of historical data to obtain useful information and to prepare the data for further analysis (Abbasi *et al.*, 2014, Berman and Israeli, 2022). Bibliometrics is a statistical method for quantitatively analyzing scientific publications and their citations on a given topic using mathematical methods (Abbas *et al.*, 2021). In this study, the scientific landscapes were examined with VOSViewer (version 1.6.19). There are a lot of scientific databases, but many researchers use the Scopus database for selecting articles to perform analyzes (Abbas *et al.*, 2021, Abbas *et al.*, 2022, Huma *et al.*, 2022) because they are Compared to other databases, e.g. Web of Science (WoS) or SpringerLink, offers a larger selection of publications (Paul and Criado, 2020; Sikandar *et al.*, 2021). For this reason, we have also decided on Scopus.

Table 1. Data basis

Search string applied to title, abstract and keywords	Core hits	Hits in subject area
corporate citizenship	1.762	1.034
corporate social sustainability	31.620	19.393
corporate social initiatives	5.262	3.192
corporate sustainability	14.435	7.898
corporate sustainability reporting	2.473	1.551
environmental social governance	12.670	1.688
non-financial	10.011	5.297

Source: contribution of the authors

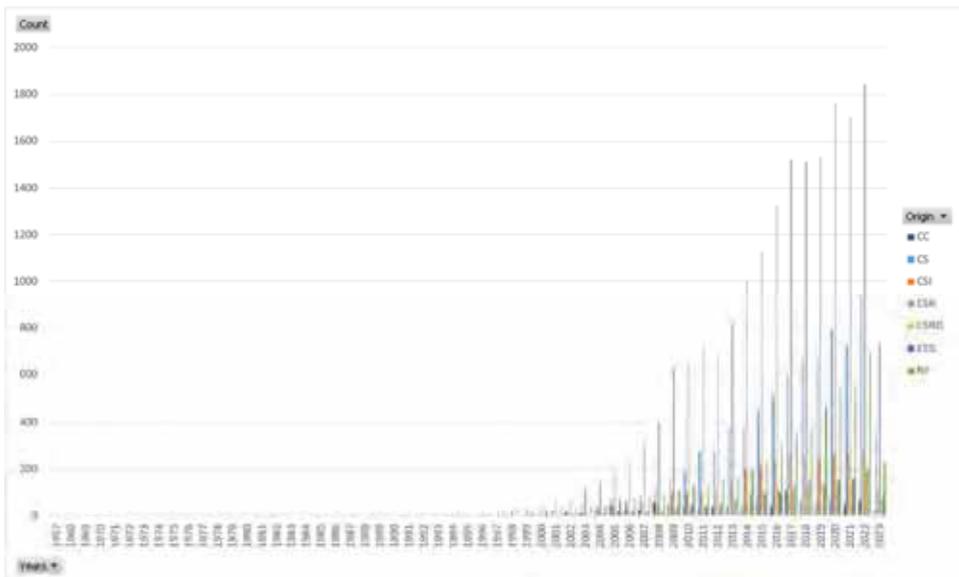
The search was performed on 04/19/2023 and we searched the library for publications with the keywords “corporate citizenship” OR “corporate social sustainability” OR “corporate social initiatives” OR “corporate sustainability” OR “corporate sustainability reporting” OR “environmental social governance” OR “non-financial”. The search was restricted to the subject "Business, Management, and Accounting". Table 1 shows the respective search term, the number of all hits and the number of hits after restriction to the subject "Business, Management, and Accounting".

4. ANALYSIS

The hits per search string described in chapter 3 were each exported in CSV format, with all information selected. The descriptive analysis was carried out in Microsoft EXCEL completely.

4.1. Descriptive analysis

As Figure 2 shows, the topic of this paper goes back to the year 1957. Specifically, one publication occurred according to “CSR”. Since the millennium the publications in this have been rising significantly. “CSR” is also leading the overview with over 1.800 publications in the year 2022. Followed by “CS” and “NF” in general, “Corporate Social Responsibility” and “Corporate Sustainability” seem to be the latest most referred report types.



Source: contribution of the authors

Figure 2. Number of publications per year

Table 2. TOP 10 Publishers

Name	Publications
Emerald	6.811
Springer Nature	5.444
Elsevier	3.246
John Wiley and Sons	2.560
Taylor and Francis	1.918
SAGE	1.251
Routledge	1.060
Inderscience	1.050
IGI	670
Edward Elgar	385

Source: contribution of the authors

7 out of the list of the TOP 10 publishers in Table 2 are in Europe and therefore, they lead the publications by nearly 82 %, respectively (affiliation to corporate groups is considered). The remaining 3 publishers are in the USA and are responsible for about 18 % of the publications, respectively.

Table 3. TOP 10 Countries

Name	Publications
United States of America	4.037
United Kingdom	2.396
Australia	1.605
Spain	1.487
Italy	1.412
China	1.364
India	1.338
Germany	1.171
Canada	905
Malaysia	726

Source: contribution of the authors

In contrast to Table 2, only 4 of the TOP 10 countries in Table 3 are in Europe. In sum, about 39 % of the publications come from European countries and about 25 % come from the USA, respectively. Around 21 % of the

publications come from Asian countries, while 10 % come from Australia and the remaining 5% come from Canada.

4.2. Bibliometric analysis

For the data visualization via VOSViewer, following settings had been made:

- Map based on text data from a bibliographic database file;
- Extraction from abstract fields (structured abstract labels and copyright statements ignored);
- Counting method: full counting;
- Minimum number of occurrences: 10% of the sample;
- Number of terms: 100%.

The resulting map data was exported from VOSViewer in CSV format. The data included to occurrences and the link strength per term. These values were multiplied for each term to receive a weighted score.

Furthermore, each term got categorized and following categories were used:

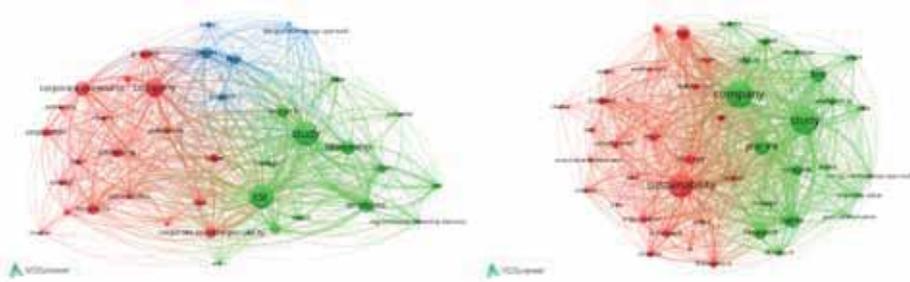
- Environment,
- Finance,
- Governance,
- Innovation,
- Miscellaneous,
- Reporting,
- Risk,
- Society,
- Sustainability.

Please note that the category “Miscellaneous” is excluded from the further analysis and therefore not viewable in this paper.

4.2.1 Data visualization and rough interpretation

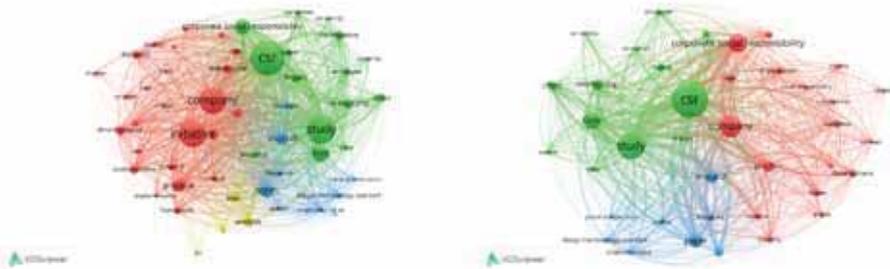
Figure 3, Figure 4, Figure 5, and Figure 6 show the data visualizations. VOSViewer derives data clouds conducting the selected terms, their occurrence, as well as their link strength which is a value of relations between the terms. Furthermore, VOSViewer creates groups which contain terms with significant relation to each other and colors these in the cloud automatically.

This analytical process makes an initial rough interpretation possible. It is quite remarkable that the abbreviation “csr” is present in all 7 clouds. As mentioned, this abbreviation stands for “Corporate Social Responsibility” and, as already showed in Figure 2, its occurrence is not surprising, respecting the historical data.



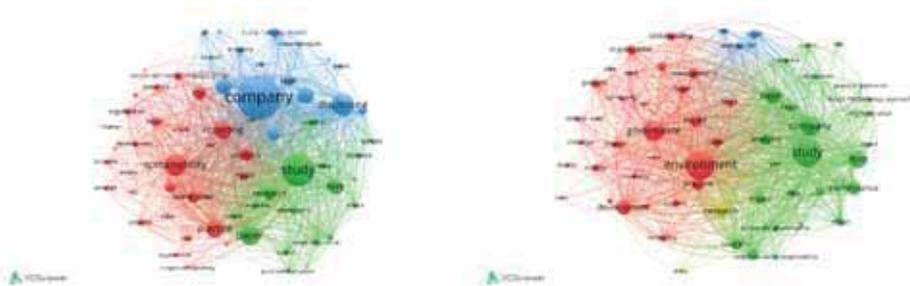
Source: contribution of the authors

Figure 3. Data visualization “CC” (left) and “CS” (right)



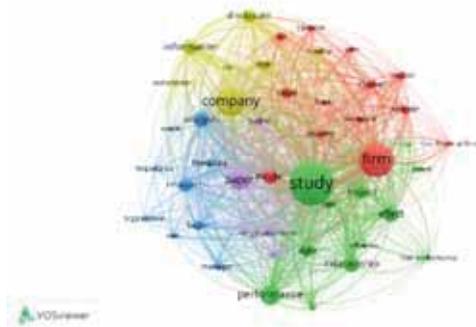
Source: contribution of the authors

Figure 4. Data visualization “CSI” (left) and “CSR” (right)



Source: contribution of the authors

Figure 5. Data visualization “CSRD” (left) and “ESG” (right)



Source. contribution of the authors

Figure 6. Data visualization “NF”

Table 4. Most significant terms from the data visualization

Report type	Terms	Focus acc. categories
CC	“company”, “csr”, “study”	Governance, Reporting, Innovation
CS	“company”, “study”, “sustainability”	Governance, Innovation, Sustainability
CSI	“company”, “initiative”, “study”, “csr”	Governance, Innovation, Reporting
CSR	“csr”, “corporate social responsibility”, “study”, “company”	Reporting, Innovation, Governance
CSRD	“company”, “study”, “sustainability”, “disclosure”	Governance, Innovation, Sustainability, Reporting
ESG	“governance”, “environment”, “study”	Governance, Environment, Innovation
NF	“study”, “company”, “firm”	Innovation, Governance

Source: contribution of the authors

All the report types have specifically two categories in common: “Governance” and “Innovation”. Therefore, it is suggested that companies use these reports for organizational and technical development, or rather reporting of corresponding projects in these areas. In general, the content refers to the report title, e.g., “CS” (Corporate Sustainability) includes “Sustainability” topics and “ESG” (Environment Social and Governance) contains “Environment” topics.

4.2.2 Fine analysis

To create a deeper analysis of the focus of the different report types, the resulting terms are categorized as described. The categorization is shown in Table 5.

Table 5. Keyword categorization

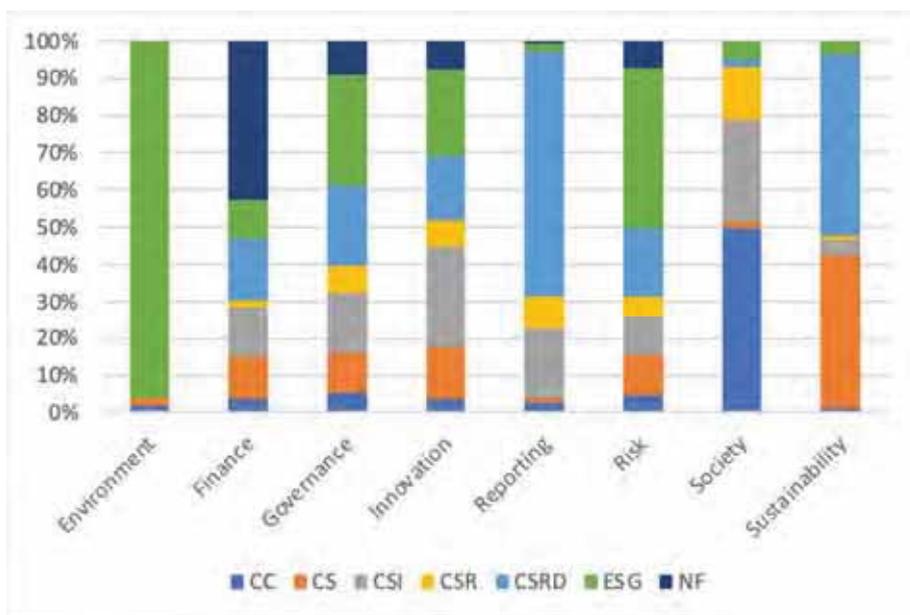
Keyword	Category
annual report	reporting
approach	innovation
bank	finance
board	governance
business	finance
change	innovation
citizenship	society
community	society
company	governance
concept	innovation
consumer	society
content analysis	innovation
context	governance
corporate citizenship	society
corporate governance	governance
corporate social responsibility	society
corporate sustainability	sustainability
corporation	governance
country	governance
csr	reporting
csr activity	reporting
csr initiative	reporting
customer	society
design methodology approach	innovation
development	innovation
economy	finance
employee	society
environment	environment
esg	reporting

Keyword	Category
evidence	reporting
financial performance	finance
firm performance	finance
framework	governance
global reporting initiative	reporting
governance	governance
government	governance
gri	reporting
industry	finance
influence	governance
initiative	innovation
innovation	innovation
integrated reporting	reporting
investor	finance
issue	risk
management	governance
manager	governance
market	finance
non financial firm	finance
ocb	society
organization	governance
organizational citizenship behavior	society
originality value	innovation
relationship	governance
report	reporting
reporting	reporting
research	innovation
research limitations implication	innovation
risk	risk
sdgs	sustainability
social responsibility	society
society	society
stakeholder	governance

Keyword	Category
strategy	innovation
study	innovation
sustainability	sustainability
sustainability report	reporting
sustainability reporting	reporting
sustainable development	sustainability

Source: contribution of the authors

To get an overview of the respective focus of the report types with regard to their content, the categorization was linked to the score of each term. The sums per category and type of report were each set in relation to obtain a percentage distribution. The results are shown in Figure 7 and Figure 8.



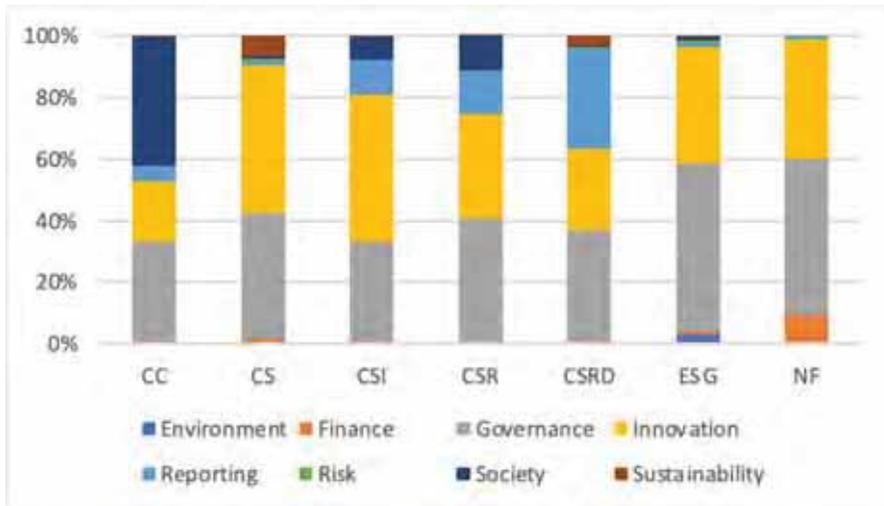
Source: contribution of the authors

Figure 7. Overall category-related

The category “Environment” seems to play a role only in “ESG”, while “NF” has a very financial focus, although it is actually about “non-financial” information. “Reporting” is mainly represented in “CSRD” and “Risk” is mainly dealt in “ESG” again. “CC” has the most “Society” content and therefore, a very

social focus. “Sustainability” is mainly represented in “CS” and “CSR”, as already mentioned previously.

Some insights from the rough interpretation are repeated in Figure 7, e.g., the focus on “Governance” and “Innovation” topics, as well as the “Environment”, “Sustainability, and “Reporting” focus of some report types. The focus on “Finance”, “Risk”, and “Society” topics could be derived additionally.



Source: contribution of the authors

Figure 8. Overall report-related

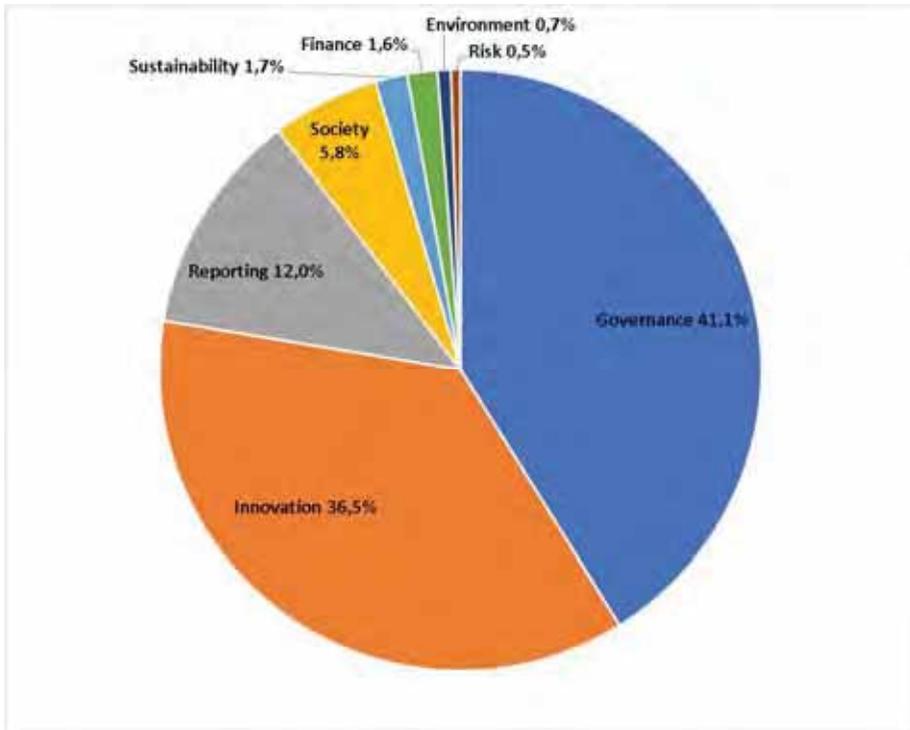
Figure 8 shows the report-related overview. The findings from the rough analysis are presented even more clearly here. All report types seem to mainly contain “Governance” and “Innovation” topics. The suggested “Environment” focus in “ESG” almost disappears in comparison to the other topics. The only report type which seem to really refer to the actual approach is “CC” with a quite remarkable social focus.

5. CONCLUSIONS

Relating to the three-pillar-model presented in chapter 2 and combining this model with the overview in Figure 9, the whole concept of Corporate Responsibility and the reporting duties which come with this idea, seem to stand on very brittle columns and a very fragile base, speaking metaphorically.

The bibliographic analysis shows that each report type addresses its approach, but only slightly. The fact that “Governance” topics have the highest impact in these reports might stand for big flaws in organizational structures and responsibilities. Additionally, addressing “Innovation” as the second highest

topic, it seems like a lot of innovative projects are ongoing but not realized. Innovative ideas are necessary but worth nothing if no realization follows.



Source: contribution of the authors

Figure 9. Overview categories and percentual distribution

Furthermore, “Risk” and “Sustainability” go together. Companies need to understand the importance of risk-based thinking to get to be able to act sustainable. This core principle should be part of any decision made – respecting financial impacts, but also environmental and social impacts.

A possible solution might be a new global standard which addresses each of the introduced approaches. The European Union took a great step as mentioned previously, but the outcomes are still not satisfactory and leave room for improvement.

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ANALYSIS OF REPORTING TRANSPARENCY IN FINANCIAL AUDIT THROUGH KAM AND GENDER DIFFERENCES

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Abstract

One of the dimensions of quality reporting in financial auditing is the transparency of information presented in audit reports by financial auditors. In recent years, in order to improve transparency in financial auditing, and thus increase the quality of audit reports, regulators have established that a separate section of the audit report is reserved for key audit matters (KAMs). KAMs are those matters which, based on the auditor's professional judgement, are of most importance to the audit of the financial statements for a period and are selected from among the matters discussed with those charged with governance. The quality of audit reporting, as measured by ensuring transparency, may also be influenced by the characteristics that women may have in comparison to men of being prudent, careful, rigorous and more analytical. This study investigates the relationship between gender differences and transparency in audit reporting by presenting Key Audit Matters that support the audit opinion. The sample consists of companies listed on the regulated market of the Bucharest Stock Exchange from 2016-2021, and the results show that there is an influence of gender differences on financial audit transparency, in that female auditors tend to present information that is more transparent and follows the accounting principle of prudence when detailing Key Audit Matters.

Keywords: *gender differences; audit report; transparency in audit reporting; key audit matters (KAM); conservatism; audit opinion.*

JEL Classification: C12, M41, M42, M48.

1. INTRODUCTION

The quality of reporting in financial auditing is influenced, among other things, by the transparency of information presented in audit reports. In order to ensure transparency of reporting in financial auditing, auditing standards have established that from 2016 onwards a separate section of the audit report is reserved for the presentation of key audit matters (KAM). The quality of reporting in auditing, as assessed by ensuring transparency, may also be influenced by the characteristics that women may have compared to men, of being more prudent, careful, rigorous and analytical.

The study investigates the relationship between gender differences and reporting transparency in financial auditing through key audit matters (KAM) and highlights that gender differences influence reporting transparency in financial auditing through key audit matters (KAM) and prudence as an accounting principle is influenced by gender differences in financial auditing. The research is further structured in sections. After this introductory part, the paper is structured in sections: section 2 is devoted to the literature review, section 3 considers the research methodology, section 4 is devoted to the results and discussion, and the final part is reserved for the conclusions.

2. LITERATURE REVIEW AND FORMULATING RESEARCH HYPOTHESES

2.1. Transparency of financial audit reporting

To meet the increasingly sophisticated expectations of stakeholders, in recent years, reporting by organisations has undergone a number of improvements. In this context, the role of the financial auditor has also been reconsidered, with the quality of audit reporting being supported and enhanced by the adoption of new auditing standards (Grosu, Robu and Istrate, 2020). Specifically, ISA 701, “*Communicating Key Audit Matters in the Independent Auditor's Report*”, required that beginning with the audit of financial statements for periods ending at the end of 2016, a separate section referring to Key Audit Matters (KAM) be included in the audit report. This requirement was of course aimed at improving the content of the audit report and increasing transparency in financial reporting (IAASB, 2020). In other words, ensuring greater transparency in audit reporting leading to increased communication value of the audit report to support stakeholders is supported by introducing KAM in the content of the audit report (Backof, 2015; Cordos and Fülöp, 2015; Köhler, Ratzinger-Sakel and Theis, 2020). According to the standards, key audit matters are those matters which, based on the auditor's professional judgement, are of most significance to the audit of the current period's financial statements and are selected from those matters discussed with the entity's management. In other words, the extent to which a number of matters require significant attention during the performance of the audit

is based on the auditor's professional judgement (Kachelmeier, Schmidt and Valentine, 2017). Some researchers have pointed out that there are different approaches of auditors to the average number of key audit matters described at report level, their nature, which are of course also influenced by the industry in which the audited companies operate (Fülöp, 2018; Levanti, 2019).

In addition to the key audit matters, transparency of reporting in financial auditing can also be assessed by the type of opinion issued: unqualified or unqualified but with insignificant observations (Robu, Istrate and Herghilgiu, 2019). Academic research has also supported changes in audit reporting standards, supporting the development of the audit profession by enhancing the credibility offered by the auditor (Czerney, Schmidt and Thompson, 2014; Bédard, Besacier and Schatt, 2015). Transparency in reporting can also be considered to influence the performance of companies, as it has been found that firms for which audit reports have been issued mentioning issues related to going concern problems are more likely to report profits in subsequent periods than firms for which no such issues have been mentioned (Kim, 2021).

In addition, compared to previous findings, once auditors reported key audit matters in their reports in one period, the opinions issued in the audit reports of subsequent periods were predominantly unqualified. Then, the existence of key audit issues reported in a period, their number and the unqualified audit opinion will contribute to the improvement of the quality of the audit in the following period (Grosu, Robu and Istrate, 2020).

2.2. The influence of gender differences on reporting in financial auditing

Over time, there have been both theoretical and practical concerns about promoting gender equality in the workplace, particularly by supporting a balance of women and men in key positions within organisations (Grosser and Moon, 2008; United Nations, 2015; Dzubinski, Diehl and Taylor, 2019). There is also a focus on gender diversity to boost the sustainable performance of organisations and not just on employing women in leadership positions (McGuinness, Vieito and Wang, 2017).

From a practical point of view, only 12% of professional accountancy bodies in Romania have women on their boards, compared to 31% in Italy, for example (Del Baldo Tiron-Tudor and Faragalla, 2019). However, 78% of the accountants in Romania are women compared to only 32% in Italy. In 2022, the Romanian Chamber of Financial Auditors (RCAF) had more than 5,200 members, of which more than 4,200 were individuals. Of these, almost 3,000 were female auditors (CAFR, 2022). An analysis of the RCAF Annual Reports shows that, over time, the ratio of women to men in the auditing profession in Romania has been around 70%. In other countries (e.g. Spain), but also in previous periods, only 6% of the audit professional bodies were women (Carrera, Gutierrez and Carmona, 2001).

Among the determinants of gender entrepreneurship in the accountancy profession in Romania are both events within organisations and personal circumstances (Fragalla, Tiron-Tudor and Stanca, 2020). Studies over the years have looked at the extent to which women have been involved in *Big4* audit firm teams and less so female entrepreneurship (Tiron-Tudor and Fragalla, 2018). The fact is that it has been disproved that a feature of the traditional accountant stereotype is that they are male (Istrate, 2012). However, stereotypes of men and women in auditing cannot be generalised across the profession, and many studies have found gender differences (Reheul *et al.*, 2017). It is considered that if women are included in audit committees, the influence on performance is positive, but negative, however, on risk-taking (Tahir *et al.*, 2021). Another strong point made by researchers in favour of female accounting professionals is that the presence of women on audit committees leads to quality audit assignments, but at increased costs (Alderman, 2017; Lai *et al.*, 2017). Thus, the quality of financial audit engagements is influenced by gender differences, but once discretionary engagements are assessed, the quality differences between the two genders are reduced (Yang and Triana, 2017). However, audit teams that include women tend to limit the level of discretionary engagements and may thus have implications for the transparency of audit engagements and related reporting (Kung, Chang and Zhou, 2019).

Thus, the gender variable may explain some behaviours in terms of producing, validating, publishing and exploiting financial statement information. As previously stated, women accountants are more risk averse, engaging less in unethical behaviour to gain financial advantage, and are found to be more conservative, with lower reported results when they are the decision makers (Arun, Almahrog and Ali Aribi, 2015). On the other hand, according to some researchers, the psychological costs of female employees are higher than those of male employees (Becker, 1971).

Although more positive aspects associated with female accounting professionals are highlighted, when issues of negligence are found, female auditors are more frequently held accountable than men, as their negligence is often related to empathy towards the client, while male auditors are more often blamed for issues of financial dependence on a particular client (Alderman, 2017).

Based on the reviewed literature and, in particular, on patterns noted in some papers (Arun, Almahrog and Ali Aribi, 2015; Kung, Chang and Zhou, 2019; Tahir *et al.*, 2021), two research hypotheses are formulated.

Hypothesis 1: *Gender differences influence reporting transparency in financial audit through key audit matters (KAM).*

Hypothesis 2: *Conservatism, as an accounting principle, is influenced by gender differences in financial auditing.*

3. RESEARCH METHODOLOGY: POPULATION, SAMPLE, DATA SOURCE, DATA ANALYSIS METHODS

The population is represented by all companies listed on the Bucharest Stock Exchange (BSE), *the sample* analysed comprises 70 companies listed on the regulated market in the period 2016-2021 (420 observations), and *the data source* is represented by the audit reports of the companies included in the sample. *The variables* identified are qualitative variables and refer to: gender of financial auditors, type of financial auditors, existence of key audit matters (KAM), number of key audit matters (KAM), type of key audit matters (KAM), going concern problems, inefficient internal control system, but also the type of opinion issued by the financial auditor. Their description is given in table 1. *Analysis methods* consider descriptive statistics, but also multivariate data analysis methods (Pintilescu, 2007), such as Multiple Correspondence Factor Analysis (MCFA).

Table 1. List of identified variables and their description

Variable symbol	Variable description	Value
<i>Gen_FA</i>	Gender of the financial auditor	Male (M)
		Female (F)
<i>Type_FA</i>	Type of financial auditor	Big4
		NonBig4
<i>Exist_KAM</i>	Existence of key audit matters	Yes
		Not
<i>Nr_KAM</i>	Number of key audit matters	Without KAMs
		Between 1 and 5
		Between 6 and 10
		More than 10
<i>Type_KAM</i>	Type of key audit matters	Capitalisation of expenses
		Impairments
		Provisions
		Revenue recognition
<i>Go_conc</i>	Going concern problems	Yes
		Not
<i>SCI_inef</i>	Inefficient internal control system	Yes
		Not
<i>Op_Type</i>	Audit opinion type	Unqualified
		Qualified

Source: own processing

After presenting the results of the descriptive statistics, aspects that validate the research hypotheses formulated are discussed.

4. RESULTS AND DISCUSSIONS

After analysing the data and presenting descriptive statistics (see Table 2), the main results aim to identify associations between the variables identified, in different variants, in order to demonstrate that gender differences influence reporting transparency in financial auditing, taking into account key audit matters (KAM), but also that conservatism as an accounting principle in financial auditing is influenced by gender differences.

Table 2. Descriptive statistics on the variables analysed

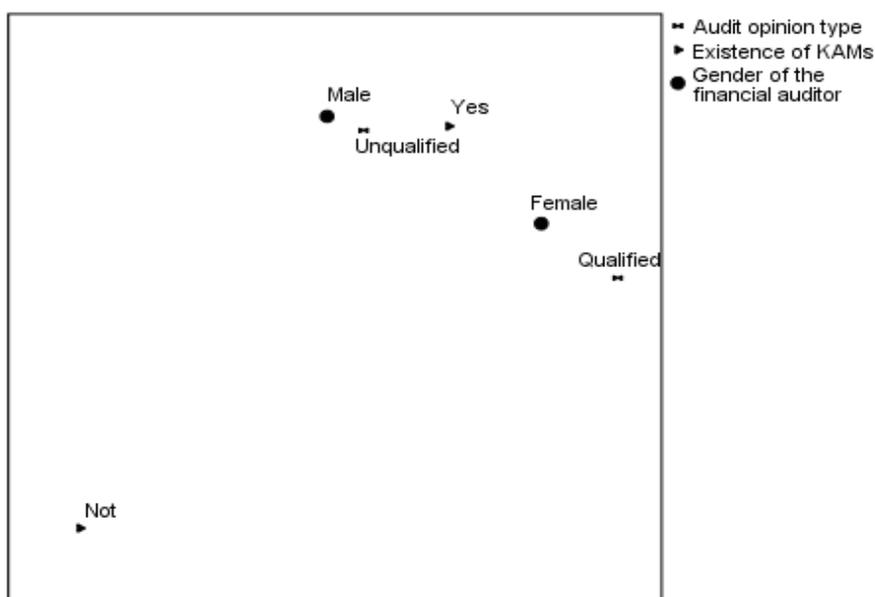
Variable		Value	Frequency of occurrence
Gender of the financial auditor		Male	58%
		Female	42%
Type of financial auditor		Big4	31%
		Non-Big4	69%
Existence of key audit matters		Yes	91%
		Not	9%
Number of key audit matters		Without KAMs	9%
		Between 1 and 5	79%
		Between 6 and 10	10%
		More than 10	2%
Type of key audit matters	Capitalisation of expenses	Yes	6%
		Not	94%
	Impairments	Yes	54%
		Not	46%
	Provisions	Yes	24%
		Not	76%
	Revenue recognition	Yes	48%
		Not	52%
	Reassessment	Yes	12%
		Not	88%
Going concern problems	Yes	31%	
	Not	69%	
Inefficient internal control system	Yes	4%	
	Not	96%	
Audit opinion type	Unqualified	79%	
	Qualified	21%	

Source: own processing

From Table 2, it can be seen that the financial auditors of the sampled companies are about 70% Non-big4 and the signatory of the audit report is mostly male. More than 90% of the audit reports report key audit issues, the most frequent, in terms of number, being between 1 and 5 issues (almost 80%). In terms of the type of audit issues reported by the financial auditors in their reports for the

period analyzed (2016-2021), the highest percentage is held by the existence of impairments, as a key audit issue (in 54% of cases), followed by revenue recognition with a percentage of 48%. Financial auditors report continuity issues in 31% of the reports issued by them for the 420 observations, and the control system characterized as effective is noted in 96% of the cases (year-firm). This last aspect can be considered to render the opinion issued unfounded in approximately 80% of cases.

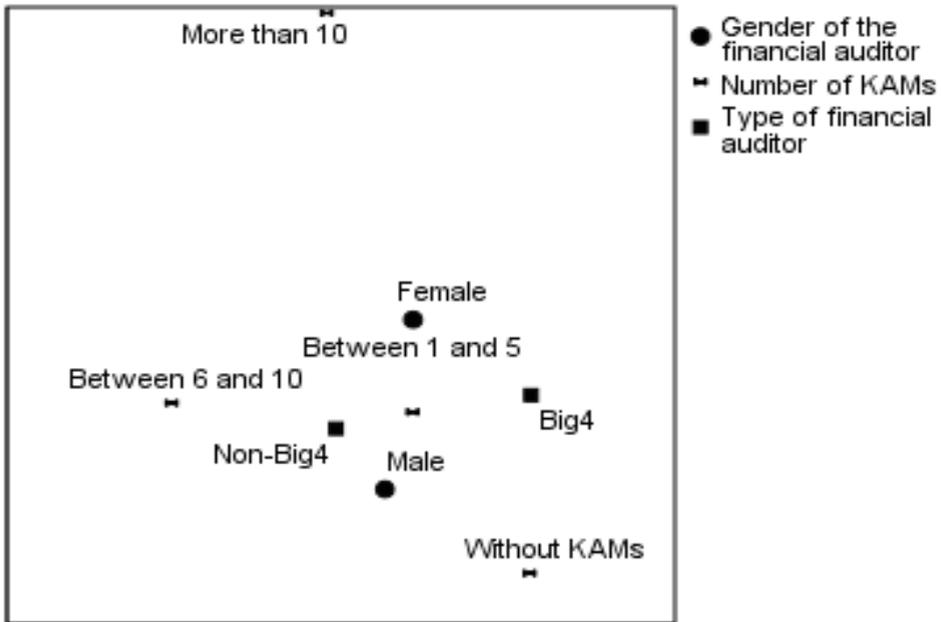
To test Hypothesis 1: *Gender differences influence reporting transparency in financial audit through key audit matters (KAMs)*, auditor gender is associated with the existence of KAMs and opinion type, on the one hand, and with the number of KAMs and auditor type, on the other hand, using the Multiple Correspondence Factor Analysis (MCFA) method, as shown in figures 1 and 2.



Source: own processing

Figure 1. Association between auditor gender, existence of KAMs and type of audit opinion

From Figure 1 it can be seen that female financial auditors tend to formulate modified audit opinions when reporting on key audit matters more than male financial auditors. As regards the existence of key audit matters, no gender differences are reported.

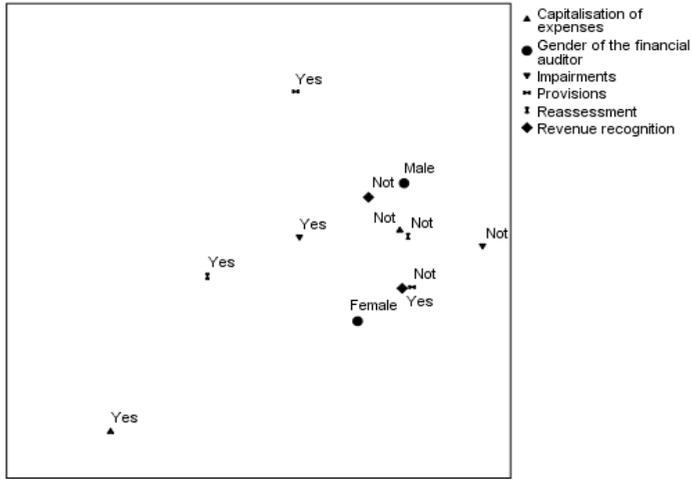


Source: own processing

Figure 2. Association between auditor gender, number of KAMs and auditor type

In terms of the number of key audit matters, it can be noted that female auditors tend to be more transparent than male auditors, in that they report more key audit matters, regardless of whether they are part of the Big4 or not. Then, audit reports where key audit matters are not reported are more likely to be written by male auditors. These results highlight that gender differences influence reporting transparency in financial auditing, in the sense that female auditors report more analytically in audit reports, which also confirms the results of other studies ((Kung, Chang and Zhou, 2019; Tahir *et al.*, 2021).

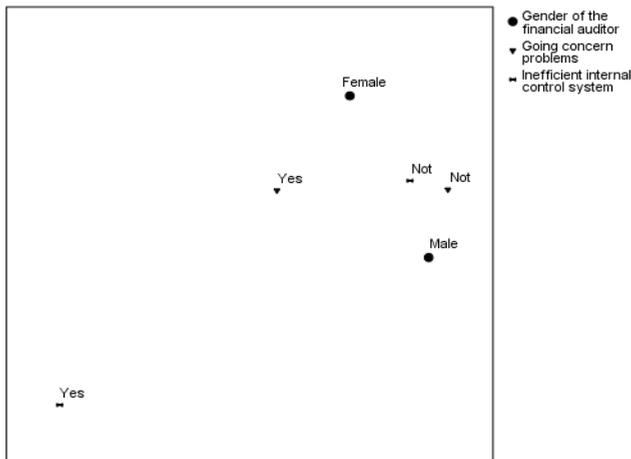
To test Hypothesis 2: *Conservatism, as an accounting principle, is influenced by gender differences in financial auditing*, the auditor's gender is associated with the type of KAMs, on the one hand, and with going concern problems and the efficiency or inefficiency of the internal control system, on the other hand, using the Multiple Correspondence Factor Analysis (MCFA) method, as shown in Figures 3 and 4.



Source: own processing

Figure 3. Association between auditor gender and KAM type

Figure 3 shows that female auditors are more likely to present impairment and revenue recognition or non-recognition aspects as key matters in the audit report, showing that they are more conservative than male auditors.



Source: own processing

Figure 4. Association between auditor gender, going concern problems and internal control system

Also, female auditors sign financial audit reports where going concern problems are raised more than male auditors. As regards the efficiency of the internal control system, gender views are approximately the same. The conclusion is that female auditors are more conservative, in line with the results of other studies (Arun, Almahrog and Ali Aribi, 2015).

5. CONCLUSIONS

The transparency of the information presented in the audit report influences the quality of company reporting. Gender differences influence the transparency of reporting in financial auditing through key audit matters (KAM), but also conservatism as an accounting principle. Given the results, it can be concluded that there is an influence of gender differences on transparency in financial auditing in the sense that female auditors tend to report more transparently. Gender differences also influence conservatism as an accounting principle, with women auditors reporting more going concern problems than men in the audit reports they provide.

In the context of the new sustainability reporting standards (EY Romania, 2022) - which at EU level will impact 50,000 entities, compared to 11,700 entities at present, and at Romanian level will impact 6,000 entities, compared to 750 entities at present - the financial auditor of an entity must provide limited assurance on the sustainability information reported by a company, which will consequently change the audit report. There is, however, also the option to move to a reasonable assurance engagement for non-financial information as well, but at a later stage. All these changes indicate that audit reporting is constantly evolving and there is still room for improvement. The present study also has limitations due to the small sample size, but it also adds value by considering the influence of gender differences on conservatism in financial auditing compared to other research.

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CORPORATE INCOME TAX VS MICRO-ENTERPRISES REVENUES TAX TAX: EVIDENCE FROM ROMANIA

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Abstract

Corporate income tax tends to become more complex and expensive, especially for small businesses. Also, for these companies, the probability of reporting a tax loss is quite high, in Romania. In these circumstances, the tax authorities created a micro-enterprise revenue tax (MERT), applicable since 2001 to companies with revenues below 100,000 euros and which still meet other eligibility conditions. After more than 10 years in which the number of companies subject to this tax was quite small (somewhere around 10% of the total number of taxpayers), the lowering of the threshold to EUR 65,000 and the introduction of the mandatory character of MERT led to a massive increase in the share of companies that owed this tax. On this occasion, businessmen discovered the advantages of such taxation: lower compliance costs, controllable tax burden, relatively low taxes paid, especially after the increase of the threshold to 1,000,000 euro. However, the MERT brought to the budget only insignificant amounts in relation to what is collected from the corporate income tax, which is why the authorities decided to lower the threshold from EUR 1.000.0000 to EUR 500,000, which was not necessarily to the liking of the entrepreneurs. Looking for other examples of income taxation, I found similar situations, with many differences, however, in other states. In Europe, we have at least Latvia and Portugal that also simplify the taxation of small businesses, but also a lot of other countries where simplification of taxation is done in different ways than MERT. In France, the revenues of large digital firms are already taxed, and Latin America offers many examples of complementary taxation of firms' revenues, instead of taxation of profits.

Keywords: *micro-enterprises revenues tax; tax simplification; tax compliance costs; corporate income tax.*

JEL Classification: H25, M40.

1. INTRODUCTION

Corporate income tax (CIT) is one of the major sources of financing public expenditure. In the collection of this type of tax, moral, ethical, solidarity, equity and social responsibility considerations can be invoked, by virtue of which companies are obliged to contribute to the constitution of public revenues. The structure of taxes levied by a State includes, in addition to the CIT, other components, depending on the fiscal policy applied by that State and the

economic, social, financial developments with influences on the behaviour of taxpayers.

Romania, with the beginning of the economic reorientation toward the market economy and the political reorientation toward a normal society, tried to modernize the tax system, with elements of originality, but with influences from the available models, both as individual countries, but also as regional or international organizations. The statistics available in the Tempo-online database of the National Institute of Statistics have as starting point the year 1991 and stop at 2020. More recent data, on 2021, and even on 2022, can be obtained from the tables Eurostat (2023) as well as from the budget information published by the Ministry of Public Finance (MPF, 2023). Even though there are some differences (generated, very probably, by the slightly different methodologies applied) between the three sources I mentioned, they do not significantly affect the overall picture they offer about the Romanian public finance system, more specifically, about the state budget.

The difficulties and the compliance costs that a CIT system creates, while it imposes strict records of revenues and, in particular, charges, as well as justifications for accounting recognition and the proposal for tax recognition of charges, have led fiscal authorities to consider and propose simplifications in the taxation of firms, especially small ones. The European Commission (2007) and Bergner and Heckemeyer (2017) identified in the literature results that found that, for small businesses, tax compliance costs are becoming disproportionately high in relation to the level of those businesses, which has led the authorities to create simplified systems for small business taxation. The most common form of simplification is the taxation of non-corporate businesses through a tax calculation system that takes into account, essentially, cash flows and not revenues/charges as designed according to the accrual accounting. Another form of simplification is to tax only the revenues of some firms, without taking into account the charges or the fact that those firms have a profit or loss.

The objective of this study is to analyse the main reasons and consequences of the introduction of the micro-enterprise revenues tax in the Romanian fiscal system, as well as the reactions of some of the parties involved to the authorities' attempts to modify some criteria for the tax classification of companies as micro-enterprises.

2. ROMANIAN STATISTICS ON CORPORATE TAXATION

One of the basic components of the direct taxation of companies in Romania is the CIT. In 1991, the revenues generated by the Romanian state from this tax had a share of 5% in GDP. However, we should remember that in 1991, Romania did not yet apply VAT, and the tax system was quite outdated, despite attempts to adapt to the new economic and social conditions after the fall of Ceaușescu. These attempts have resulted in a series of legal regulations on income taxation. After

two government decisions of 1990 (GD 201/1990 and GD 741/1990) that sought to adapt the communist legislation to the new conditions, including by introducing the term tax instead of the term pay-out, and which established extremely harsh tax conditions, in relation to what we can perceive today (rate that could reach up to 58%, depending on profitability and other criteria), as of January 1, 1991 the first modern Romanian law on corporate taxation (Law 12/1991) came into force. This law, without establishing very strict rules for the calculation of the taxable profit, complicated the calculation of the tax, given that the rates were between 0% and 77%, calculated on 68 profit tranches. Fortunately, these tranches did apply only in 1991.

Starting with 1992, it was switched to a simpler version, with two rates: 30% for profits up to 1,000,000 lei and 45% for the part that exceeded 1,000,000 lei, and without too many details about taxable income or deductible expenses. The accounting system applied in that period (until 1994, when the new Regulation for the application of the accounting law came into force) had specific that the recognition of revenues was usually made as the cash inflow arise, which was quite far from the accrual accounting applicable since 1994 and generalized, at that time, in normal countries. The wording was “taxable profit shall be determined as the difference between the revenue received and the charges referred to in Annex 2”. Even if, as of January 1, 1994, the new Romanian accounting system was switched, based on the accrual accounting, the wording of the tax law (confirmed by GD 804/1991) remained the same, referring also to the revenues received. This rule was valid for one year, until the entry into force of Government Ordinance 70/1994 on corporate income tax (GO 70/1994), which no longer refers to revenues received, but simply to revenues. Beyond the rates applied or the rules on the determination of taxable profit, the share of the CIT in GDP had, after 1991, a downward evolution, even if it showed a certain stability (Table 1). After 1997, this share decreased significantly, to around 2.5%, after which, starting with 2010, it fell (with one exception - 2016) below 2%; of course, this evolution depends not only on the revenues to the budget from the corporate tax or other taxes, but also on the size of the GDP.

In fact, the decrease of the share of CIT in the public revenues in Romania is somewhat in contrast to the developments in other countries: Bunn (2003) analyses data from OECD countries and notes an increase in the dependence of budget revenues on CIT (also reported by Devereux and Sørensen, 2006), despite the drop in tax rates. Devereux and Sørensen (2006) also confirms a substantial decrease in statutory corporate tax rates since 1980; the pace of this decrease has been variable over time, but has continued.

Table 1. Ratios of some taxes to Romanian GDP

Year	% CIT in GDP	% VAT in GDP	% MERT in GDP	% specific tax (ST) in GDP	% CIT + MERT + ST in GDP
1991	5.00	n.a.	n.a.	n.a.	5.00
1992	5.24	n.a.	n.a.	n.a.	5.24
1993	3.75	3.62	n.a.	n.a.	3.75
1994	3.83	4.56	n.a.	n.a.	3.83
1995	3.65	4.93	n.a.	n.a.	3.65
1996	3.07	6.24	n.a.	n.a.	3.07
1997	4.14	6.06	n.a.	n.a.	4.14
1998	2.91	7.97	n.a.	n.a.	2.91
1999	3.00	8.07	n.a.	n.a.	3.00
2000	2.45	8.26	n.a.	n.a.	2.45
2001	1.86	7.98	n.a.	n.a.	1.86
2002	1.96	8.87	0.14	n.a.	2.11
2003	2.20	9.23	0.18	n.a.	2.38
2004	2.59	7.30	0.18	n.a.	2.77
2005	2.24	6.61	0.19	n.a.	2.43
2006	2.28	8.00	0.17	n.a.	2.45
2007	2.52	7.47	0.10	n.a.	2.61
2008	2.49	7.79	0.07	n.a.	2.56
2009	2.08	6.72	0.08	n.a.	2.16
2010	1.89	7.35	0.01	n.a.	1.90
2011	1.82	8.48	0.03	n.a.	1.85
2012	1.82	8.48	0.04	n.a.	1.85
2013	1.71	8.13	0.10	n.a.	1.81
2014	1.83	7.62	0.12	n.a.	1.94
2015	1.93	8.02	0.13	n.a.	2.06
2016	2.02	6.78	0.10	n.a.	2.12
2017	1.71	6.24	0.18	0.01	1.90
2018	1.64	6.26	0.26	0.01	1.92
2019	1.67	6.17	0.26	0.01	1.94
2020	1.51	5.74	0.23	0.01	1.74
2021	1.68	6.67	0.23	0.00	1.92

Source: NIS (2023) - data about IP and VAT for 1991-2020 period; Eurostat (2023)- data about MERT and ST; MPF-Ministry of Public Finance (2023) - some data for 2021 year

Since 1998, when the share of CIT in GDP falls, for the first time, below 3%, the authorities were probably concerned about the situation and sought a solution that would bring money to the budget from enterprises. Of course, these small proportions in GDP can be explained most simply by the fact that the profits of the companies were small, and even by the fact that many companies reported tax losses, from which the state could hardly collect corporate tax. The economic situation, the need for reforms of all kinds, the poor institutional capacity of the Romanian state, including in checking the correctness of the establishment of the taxable base, corruption and the interventions of politicians in economic mechanisms, the recruitment and stimulation policies of the fiscal staff, the lack of experience of those who made the rules, the entry into Romania of foreign capital, managed by companies for which tax planning strategies (in the sense of lowering taxes) was a common and very well-managed policy, chaotic and difficult to verify tax facilities, the habit of Romanian companies to operate on medium and long term with negative equity (compensated by loans from associates/shareholders) represented as many causes of the decrease of the budget revenues from the CIT.

The year 2001 sees the decrease of the ratio CIT/GDP below 2% and, starting with this year, the government proposes a solution consisting in creating a distinct category of entities, which go outside the scope of CIT, to pay a tax on revenues; these entities were called micro-enterprises. We can appreciate that this new tax appeared not only as a result of the decrease in CIT revenues, but also as a result of efforts to simplify tax mechanisms, following the models proposed in other states. In the initial version of the ordinance regulating this new tax regime, the maximum revenues limit up to which a company became eligible for this tax was 100,000 euros. Part of the eligibility conditions, as well as the mandatory or optional nature of the micro-enterprise revenues tax, are presented in Table 2. The global financial crisis started in 2008 brought an additional measure of corporate tax collection, namely the minimum tax, valid in Romania between May 2009 and September 2010.

We must not forget that the rules on corporate income tax already contained a specification establishing a kind of minimum tax, depending on the revenues, for companies that carried out certain categories of activities: nightclubs, discos, casinos (from 2003 to 2015, sports betting was included in this list): the tax was 16% of the taxable profit, but could not be less than 5% of the revenues related to these activities.

The rule was also valid in the second half of 2002; until then, taxpayers with such activities calculated the CIT applying a higher rate of tax (starting with 1998).

Table 2. Conditions for the companies paying the microenterprises revenues tax

Year*	Number of employees	Maximum threshold for revenues (euro)	MERT rate (%)	mandatory/ optional
2023	cu employees***	500.000	1	optional
2022	cu employees** no employees	1.000.000	1 3	mandatory
2021	cu employees** no employees	1.000.000	1 3	mandatory
2020	cu employees** no employees	1.000.000	1 3	mandatory
2019	cu employees** no employees	1.000.000	1 3	mandatory
2018	cu employees** no employees	1.000.000	1 3	mandatory
2017	cu employees** no employees	500.000	1 3	mandatory
2016	no employees one employee 2 or more employees	100.000	3,0 2,0 1,0	mandatory
2015	no restrictions	65.000	3,0	mandatory
2014	no restrictions	65.000	3,0	mandatory
2013	no restrictions	65.000	3,0	mandatory
2012	between 1 and 9	100.000	3,0	optional
2011	between 1 and 9	100.000	3,0	optional
2010	not applicable			
2009	between 1 and 9	100.000	3,0	optional
2008	between 1 and 9	100.000	1,5	optional
2007	between 1 and 9	100.000	1,5	optional
2006	between 1 and 9	100.000	1,5	optional
2005	between 1 and 9	100.000	1,5	optional
2004	between 1 and 9	100.000	1,5	optional
2003	between 1 and 9	100.000	1,5	optional
2002	maxim 9	100.000	1,5	mandatory
2001	maxim 9	100.000	1,5	mandatory

* For simplification, I have put entire years, but some rules have been valid for fractions of years; for example, the suspension of application was made from April 1, 2010 until the end of that year, and the new conditions imposed in 2017 were applicable from 1 February 2017.

** The condition regarding the employee is considered fulfilled if the employment is carried out within 60 days, including from the date of registration of the respective legal person.

*** If the firm does not have an employee, it became a CIT payer tax.

Source: Istrate (2022, pp. 204-205)

For the English version of the name of this tax (named in Romanian *impozitul pe veniturile microîntreprinderilor*), I find several formulations: in the Eurostat document from which I took the data presented in Table 1, the wording is *tax on micro-enterprises incomes*, one consultancy company calls it *micro-company revenue tax* (PwC, 2023), another consultancy companies uses the term *micro-enterprise income tax* (KPMG, 2023) or *microenterprise income tax* (EY, 2023 and Deloitte, 2023). I think that, to avoid ambiguities, the most appropriate version would be *micro-enterprises revenues tax*.

The introduction of MERT represented a measure that led to the collection of low taxes from all entities, whether they reported profit or loss. We can also make some simplistic calculations that show us under what conditions the CIT would have been more favourable than the MERT:

- at the initial rate of 1.5%, the maximum tax would have been $1.5\% \times 100,000 \text{ euro} = 1,500 \text{ euro}$; in order for a CIT liability to be 1,500 euros, the calculation basis (apart from tax credits and other facilities) should have been given by a taxable profit of $1,500/0.16 = 9,375 \text{ euros}$;

- at the rate of 3%, the maximum income tax was $3\% \times 100,000 = 3,000 \text{ euros}$; the taxable profit for such an amount would have reached $3,000/0.16 = 18,750 \text{ euros}$;

- at the rate of 3% and maximum income of 65,000 euros, the maximum income tax reached 1,950 euros, corresponding to a possible fiscal profit of 12,187.5%;

- the transition to the threshold of 500,000 euros led the maximum income tax to $1\% \times 500,000 = 5,000 \text{ euros}$ or to $3\% \times 500,000 = 15,000 \text{ euros}$, for which, if it were for CIT, the tax result should have reached $5,000/0.16 = 31,250 \text{ euros}$, respectively $15,000/0.16 = 93,750 \text{ euros}$;

- the threshold of 1,000,000 euros led to a maximum tax of $1\% \times 1,000,000 = 10,000 \text{ euros}$ or $3\% \times 1,000,000 = 30,000 \text{ euros}$, translated into possible taxable profits of $10,000 / 0.16 = 62,500 \text{ euros}$, respectively $30,000 / 0.16 = 187,500 \text{ euros}$.

We could see, from the simple simulations above, that the approach to the maximum ceiling up to which income tax could be paid led to fairly consistent amounts paid as tax. However, the MERT made a maximum contribution of 0.26% of GDP in 2018 and 2019, well below the CIT contribution to the public revenues. These figures are all the more worrying for the authorities, as the share of the companies paying MERT was very high in the total companies in Romania. For companies, this tax is very easy to budgeting, without the worries inherent in the deductibility of expenses, over which doubts can almost always arise.

If, for the CIT, the tax rules establish non-taxable revenues, non-deductible charges and tax deductions (including the possibility of carrying forward the loss), in the case of the MERT, the revenues that form the basis of calculation are established starting from the accounting revenues, with some adjustments. Thus, pseudo-revenues are not taken into account in taxation, i.e. those that do not meet

the accounting criteria for recognition as revenues: they don't lead to the company's enrichment, resulting in increases in net wealth (equity), but rather are intended to compensate for the effect of some charges on the net income. This is mainly the pseudo-incomes accounted for with the reception of products and work in progress (in fact, Changes in inventories of finished goods and work in progress), those from the reversal of provisions/depreciation adjustments. Here we can also include the revenues generated by grants and subsidies – also non-taxable at the MERT.

For a very long period (2001-2016), the classification of micro-enterprises was made on the basis of a relatively low threshold: EUR 100,000, except for the years 2013-2015, when the ceiling was EUR 65,000 (equal, at that time, to the one below which companies could apply the special scheme of exemption of VAT for small enterprises). The political change generated by the 2016 elections, when the Social Democratic Party came to power, with about 45%, together with their ALDE ally, with 5.6%, allowed the new government – with majority support in Parliament – to try various changes – some radical – of the Romanian legislation. Besides the famous and, fortunately, the unapplied ordinance 13/2017 (GO 13/2017), which tried to amend some provisions of the criminal law, with the suspicion that it was in favour of party leaders, the succeeding governments also had the intention to introduce a generalized revenues tax to replace the CIT. It was publicly discussed about this tax, with arguments that were mainly related to the possibilities that multinationals with businesses in Romania had not to pay too much CIT in Romania (Velicu, 2017). This method of taxation was not applied, after all, in Romania, as a result of the fact that it would not have been accepted by the European Union (Cireaşă, 2017). Following the failure to introduce this generalized revenues tax, the majority party of the Romanian Government in 2017-2018 significantly extended the limit to which companies can be eligible for the MERT, from 100,000 euros in 2016 to 500,000 euros, starting with February 2017 and to 1,000,000 euros, starting with January 2018.

In Table 3, I have taken over, from public sources and literature, the number of companies registered as payers of MERT and CIT: the main source are the national fiscal authority (NAFA) statistical bulletins, available since 2010. In the last of the four numbers for each year, NAFA provides statistics on the number of companies, by categories of paid taxes.

Table 3. Tax payers for CIT and MERT

Year	Number of taxpayers at December 31				Ratios to GDP (%)	
	CIT		MERT		CIT	MERT
	N	%	N	%		
2022	128,114	12.31	912,875	87.69	n.a.	n.a.
2021	121,269	12.34	861,235	87.66	1.68	0.23

Year	Number of taxpayers at December 31				Ratios to GDP (%)	
	CIT		MERT		CIT	MERT
	N	%	N	%		
2020	118,477	12.88	801,377	87.12	1.51	0.23
2019	115,987	13.19	763,409	86.81	1.67	0.26
2018	103,993	12.64	718,767	87.36	1.64	0.26
2017	137,253	17.70	638,399	82.30	1.71	0.18
2016	196,772	28.44	494,993	71.56	2.02	0.10
2015	223,659	31.13	494,748	68.87	1.93	0.13
2014	220,043	32.86	449,628	67.14	1.83	0.12
2013	221,549	33.70	435,869	66.30	1.71	0.10
2012	571,618	89.22	69,081	10.78	1.82	0.04
2011	640,623	91.67	58,226	8.33	1.82	0.03
2010	824,882	-	n.a.	-	1.89	0.01

Source: Fiscal statistical bulletins of NAFA (2023), NIS (2023), Eurostat (2023), and Istrate (2022, p. 206)

From Table 3, we see that the share of payers of MERT has become very consistent, starting with 2013, when the regime became mandatory (I cannot comment on the situation between 2001 and 2009, in the absence of official data). Apart from the conclusion that most Romanian companies have low revenues, we can also imagine that the administration of the MERT, on the part of taxpayers, is much easier, much less ambiguous and is much better suited to the behaviour of the Romanian company administrators, than in the case of CIT. Indeed, MERT eliminates almost any reference to charges: it is no longer a question of whether they are deductible or not, that is, the company's concerns from this point of view have diminished significantly. We can assume that, in the accounts of the companies paying the MERT, we find significant charges that would not have been accepted as deductible, in the case of the CIT. We can ask what happens, in the companies where the main associate is also administrator, with the expenses related to the lack of goods found at the inventory, with the expenses related to the maintenance and operation of the cars used by the family or the close of the administrator, with other expenses related to affiliated persons, the costs for which the supporting documents are at the limit, etc.

For the tax authorities, even if, from their point of view, the administrative costs of MERT are lower than in the case of the CIT and the risks of tax evasion decrease significantly, the small contribution to the state budget probably represented a signal that companies prefer the simplicity of this tax and consider that its impact on the company's finances is lower than in the case of CIT. In the

substantiation note aimed at amending the tax code (MPF, 2022), the government acknowledges that the tax burden of micro-enterprises is low and that businessmen choose to fragment the activities carried out, in order not to exceed the ceiling of 1,000,000 euros.

As often in taking legislative decisions with a significant impact on the business environment, the Romanian authorities invoke, in the same substantiation note mentioned above, the recommendations of the international financial bodies (IMF and WB), of the European Commission, in justifying the decrease, from 2023, of the maximum ceiling up to which companies can opt for MERT.

The reaction of small Romanian companies did not delay to appear: these companies have so well adapted to the MERT (“simple, clear and uninterpretable system and without fiscal stress”), with the advantages mentioned above, that a representative of CNIPMMR declared that the measure of the decrease of the ceiling is without economic justification, given that only about 8,000 companies declared revenues between 500,000 and 1,000,000 euros (CNIPMMR, 2022; Mihai, 2022). Moreover, in Latvia, a similar tax regime became so popular with the tax advantages created by eligible companies, the number of companies applying it increased rapidly, leading to unexpected consequences, creating distortions in the economy and forcing the authorities to modify essential characteristics of the tax. In order to avoid dividing businesses into multiple companies, the new Romanian rule establishes that a person may own no more than 25% of the capital than at most three micro-enterprises subject to MERT. Also, in order to stimulate employment and bring money to the budget as tax and salary contributions, the new rule on micro-enterprises eliminates the possibility for a company without employees to apply this regime – such companies automatically become payers of CIT.

3. SOME OTHER EXPERIENCES ABOUT THE TAXATION OF THE REVENUES OF THE COMPANIES

Taxation of revenues rather than profits is a solution that other countries have used or have tried to apply, faced with the behaviour of firms in order to significantly reduce their taxable profit or with difficulties generated by various crises.

Latvia introduced in 2010 a Micro-Enterprise tax (MET) valid for companies with turnover below 100,000 euros, the cap decreased to 40,000 euros in 2018 (Leibus, 2019). The application of this regime required the fulfilment of other conditions, including the existence of 5 employees, one person could own only one company to apply the regime, one person could be employed at only one company eligible for this tax system (condition removed later). The rate of this tax applied in Latvia was 9% in 2010 and 15% in 2018, given that, in fact, that tax completely replaced several other taxes and contributions, including labour

contributions, which greatly simplified the taxation of the companies involved and reduced the tax compliance costs, with the decline of undeclared work.

In 2019, after two years of preparation, the French government began the formalities for issuing a law setting a minimum tax of 3% on the revenues of companies in the field of digital technologies (Google, Amazon, Facebook, Apple, etc.). This law was adopted by France in July 2019 (Loi 759/2019), and its application was limited to multinational companies with total global revenues of at least 750 million, of which 25 million were made in France. According to a French minister, this tax has brought about 700 million euros a year to the state budget. France has been supported by other countries in this way of taxing global internet companies, but the global generalization of such taxation – through the OECD – has to faced strong opposition from some large countries – the USA, India, Saudi Arabia (Le Figaro, 2023). Also in France, there is a special simplified system of taxation of micro-enterprises that does not necessarily mean the taxation of revenues, as in Romania, but the taxation of a profit obtained by deducting a flat rate of charges from revenues/turnover, depending on the type of activity (Bercy Info, 2023). This scheme applies to annual net turnover below EUR 188,700 for some activities or below EUR 77,700 for other activities.

In Portugal companies could apply – since 2001, suspended in 2009 and reintroduced, with some differences, in 2014 – a simplified optional tax regime for businesses of less than EUR 200,000 (reference is also made to a maximum limit of 500,000) euros for the assets). These companies are not subject to CIT, but to an revenues tax calculated by applying quotas of maximum 1%, depending on the activity (Dâmaso and Martins, 2016; PwC, 2022a; Pais and Dias, 2022). However, Pais and Dias (2022) find data suggesting that many Portuguese eligible companies are not opting for this regime, especially as a result of the potential tax increase paid.

Scot (2020) writes about the situation in Honduras, where companies whose revenues exceed 10 million lempira (about \$400,000) must pay 25% of their profits, but not less than 1.5% of their revenues. In these circumstances, Scot (2020) finds an unnaturally high number of companies with revenues immediately below the threshold of 10 million lempira, which makes him conclude that these companies manipulate the revenues so as not to exceed the respective ceiling and, consequently, for not paying taxes. The covid-19 pandemic has significantly affected Ecuadorian micro-enterprises, so the law has changed to the effect that companies with less than 300,000 euros pay an annual tax established by applying rates from 0% to 2%. In fact, Latin America comprises many countries (including Argentina, Brazil, Mexico, Colombia) where corporate income tax is supplemented or replaced by some corporate revenues tax (Arias, 2022).

In the United States, following the change in corporate tax rules, the tax rate fell from 35% to 21% under the Tax Cuts and Jobs Act of 2017. The health crisis, followed by the military crisis in Ukraine, the tax evasion practices of the US

companies, added to other factors, led US authorities to introduce a tax mechanism to ensure that corporate tax is obtained by applying the tax rate to a profit as close as the accounting profit, reported to ordinary users of accounting and financial information. This mechanism, called the Corporate Alternative Minimum Tax (CAMT), (re)appeared in 2022, with application since 2023 and refers to companies whose adjusted profits exceed 1 million USD for three consecutive years (IRS, 2022; PwC, 2022b). In fact, this measure requires the prior calculation of the CIT, according to the general rules, after which the CAMT is calculated and the highest amount is due to the tax authorities.

The use of thresholds for businesses that are subject to a simplified tax regime is very common. Bergner and Heckemeyer (2017) present statistics on European countries and, for non-corporate entities, identifies thresholds ranging from 25,565 euros per year to 1,500,000 euros per year (at 2010 level); being below these thresholds makes companies eligible to set tax on a cash flow basis.

4. CONCLUSIONS

Taxing companies' profits is a complex and costly action, both for the authorities and for taxpayers, without many chances of simplifying in the foreseeable future, on the contrary. The not always very high yield of the corporate income tax in Romania, as well as the tax evasion/ tax planning possibilities it allows, have led the Romanian tax authorities to create, starting with 2001, a category of companies that exit the CIT system, paying tax on the revenues of micro-enterprises (MERT). The initial ceiling of 100,000 euros of revenues up to which this regime could be applied (along with other specific conditions) made the number of companies in this category initially quite limited. After two initial years (2001 and 2002) in which it was mandatory, MERT becomes optional (until 2012) and does not yet attract many companies: Somewhere up to 10% of the number of taxpayers registered within this tax system. Starting with 2013, the decrease of the ceiling (to 65,000 euro, for three years) and the reintroduction of the obligation to pay this tax for eligible companies led to a massive increase in the number of companies paying MERT, up to 70% of Romanian companies. On this occasion, entrepreneurs quickly discovered that MERT is much easier to manage than corporate tax and, even if it is paid under the conditions of accounting/tax loss reporting, the tax burden relative to tax compliance costs is easier to bear than for the classic corporate tax.

The political options of the Romanian government led, starting with 2017, to a significant increase in the ceiling – to 500,000 euros in 2017, to move to 1,000,000 euros starting with 2018 – which led to almost 90% of companies becoming payers of MERT. The success of MERT among businessmen also led to unexpected consequences, such as the fragmentation of businesses across multiple firms, so that the ceiling would not be exceeded, to avoid to enter in the CIT category. However, despite the extremely large number of taxpayers in the

MERT, the contribution of this tax to GDP remained very modest: No more than 0.26% of GDP (in 2018 and 2019). This figure is very low in relation to what the CIT bring to the public revenues, even if CIT is paid by slightly more than 12% of companies: about 0,25% compared with about 1.6% of GDP in recent years.

In the face of these figures and the high need for money to the budget, in the context of two successive major crises (covid-19 and the war in Ukraine), the Romanian tax authorities decided to change the conditions for the classification as a payer of MERT, by (re)bringing the revenue threshold to 500,000 euro and introducing the obligation to have at least one employee, once limiting to 3 the number of micro-enterprises in which a shareholder may own 25% or more of the capital. This decision was not well received by the businessmen.

Comparing the Romanian situation with what is happening in other states, I found elements of similarity, even though the context of revenues taxation instead of profits taxation and the manner of establishing revenues tax are different. Latvia has an income tax system that replaces the majority of corporate taxes (including taxes/salary contributions) for companies with incomes below 100,000 euros (limited at 40,000 euros). France has already raised money to the budget from taxing the revenues of major digital technology firms, but it also has a simplified taxation system for micro-enterprises. In Portugal, too, we have a revenues tax for businesses of less than 200,000 euros. Complementary revenues tax systems are also found in many Latin American countries.

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A BRIEF LITERATURE REVIEW ON THE PROXIES USED TO MEASURE THE CORPORATE INCOME TAX AVOIDANCE

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Abstract

In developed countries, corporate income tax (CIT) represents an important source of revenues to public budgets: in 2020, CIT brought to the budgets about 2.4% reported to the GDP. CIT was and still is one of the most appropriate taxes in terms of the possibilities to reduce the amounts paid, to report figures that say nothing to the less initiated in sophisticated financial reporting techniques. Otherwise, we would not see a series of international, regional and national regulations trying to limit the proportion of the tax avoidance (TA) or of the tax evasion (TE). The definition of TA/TE is not achieved uniformly in regulations or literature. Following Hanlon & Heitzman (2010), I aim to identify in the literature definitions of TA, its forms, as well as indicators by which it can be measured.

In the study, I will address the definition and characterization of corporate income tax avoidance, then I will focus on the variables used in literature to measure or estimate corporate income tax avoidance, on the financial or non-financial, microeconomic or macroeconomic indicators that influence TA, but also on those on which TA has effects.

Keywords: *corporate income tax; tax avoidance/tax evasion; book-tax differences; effective tax rate.*

JEL Classification: H26, M41.

1. ON THE DEFINITIONS OF THE TAX EVASION / TAX AVOIDANCE

TA and TE represent one of the taxpayers' reactions to the existence of taxes, especially if the pressure that these taxes create is perceived as very burdensome. Coles *et al.* (2022) shows that the taxation of firms distorts their behaviour by making them adjust their economic decisions, including the level of production and sales, the use of inputs or investment or personnel policy.

Hanlon and Heitzman (2010) warn us that there is no universally accepted definition of TA, and it is quite possible that the meanings of tax evasion, tax avoidance, tax aggressiveness, tax planning, tax minimization, tax management should be different for different authors. As a conceptual starting point, Hanlon & Heitzman (2010) propose a very broad definition of tax avoidance: explicit reduction of paid taxes. Simser (2008) state that “tax evasion is unacceptable; tax

avoidance is perfectly acceptable”. The accounting research on TA have many decades: Dyreng Hanlon and Maydew (2019) show that they began in 1980.

Tax compliance and its opposite – tax evasion – are under the influence of many factors, presented in the economic, financial, accounting, tax literature, etc. Generally speaking, regarding all taxes in a society, Ritsatos (2014) presents a literature review in which he identifies: economic freedom, the importance of financial markets, type of legal regulation, enforcement of law, crime rate, perception of legitimacy of authorities’ actions, quality of education, complexity of rules, trust in authorities, example of opinion leaders, the level of development of the country, the level of sanctions for non-compliance with the law and the way of applying these sanctions, the membership of various social groups, the possible incentives granted by the authorities to those who comply with the tax, cultural characteristics, the level of the informal economy and tolerance to it, demographic factors, the influence of tax consultants.

Most proxies of TA are based on the financial statements, because tax returns are usually not available (Hanlon and Heinzman, 2010). The 12 measures identified by Hanlon and Heinzman (2010) as being used to quantify TA are:

- 1) GAAP effective tax rate – GAAP ETR - (or accounting ETR - AETR)> total income tax expense divided by the pre-tax income;
- 2) current ETR: current income tax expense divided by the pre-tax income;
- 3) cash ETR: the income tax paid divided by the pre-tax income or by a cash flow;
- 4) long run ETR: tax paid or expensed, cumulated over a longer period of time (n year, by n = 3, 5 or even ten years), divided by the pre-tax income on the same period;
- 5) differential ETR: the difference between the statutory tax rate (STR) and ETR;
- 6) DTAX: the error from the following regression: $ETR_{\text{differential}} \times \text{pre-tax book income} = a + b \times \text{controls} + E$;
- 7) total book-tax difference (BTD): $\text{pre-tax income} - [(\text{national income tax expense} + \text{foreign tax expense}) / \text{statutory national tax rate}] - (\text{net operating losses in the current year} - \text{net operating losses in the previous year})$;
- 8) temporary BTD: deferred tax expense in relation to the national statutory tax rate;
- 9) total abnormal BTD: the residual from the regression $BTD / \text{total accruals} = \beta \times \text{total accruals} + \beta_m + E$ (where m may represent one or more variables);
- 10) unrecognized tax benefits: a US GAAP-specific information, representing “tax liability accrued for taxes not yet paid on uncertain positions”;
- 11) tax shelter activity: information identified in the companies’ reports
- 12) marginal tax rate: the present value of the tax for an additional unit of profit.

The indicators by which TA is measured are approximate and must be interpreted with caution. Drake, Hamilton and Lusch, (2020), for example, shows that TA observed through specific proxies does not necessarily come from an intentional tax planning, but also from changes in tax law or from the carrying forward of the tax loss.

2. EFFECTIVE TAX RATES (ETR)

Effective tax rates (ETRs) have long been used to measure tax planning levels or in public discussions on issues related to tax regulatory developments. As a basic model, an ETR is calculated by dividing income tax by pre-tax income.

There are at least three possibilities in terms of the numerator: the total income tax expense (current and deferred), the current tax expense or only the tax actually paid. For companies with multinational presence, the total tax expense can be taken at the numerator, but it can be replaced by an indicator taking into account the country of origin of the respective tax. At the denominator we can take the pre-tax income, but there are also authors who adjust this result with various amounts, such as, for example, the result from extraordinary activities, or temporary differences; Also, when we talk about ETR cash, at the denominator can be put the operating cash flow or the total cash flow.

An ETR lower than the STR shows that the net book income reported includes elements that have not been and will not be found in the taxable income (Armstrong, Blouin and Larcker, 2012), for various reasons.

A common situation in the calculation and interpretation of ETR is the existence of negative net income. Gupta and Newberry (1997) identify the solutions proposed by literature to overcome this situation:

- a. the ETR shall be considered to be zero, if the tax expense is negative and the pre-tax income is also negative;
- b. ETR is considered to be 100%, when the tax expense is positive or zero and the result is negative or zero.

There are many other ways to winsorize outliers in ETR, including radical one – elimination of these observations.

As I mentioned above, an ETR itself does not say much – it must be compared to the statutory tax rate. This comparison is all the more useful in long-term analyses, as the statutory rates change – as a rule, decreasing – and the longitudinal interpretation of the ETR may become meaningless.

Tang, Lan Mo and Chan (2017) propose two modified effective tax rate (METR): ETR/ATR (applicable tax rate): the lower METR, the higher the TA. Lin *et al.* (2017) subtract the applicable rate (ATR or STR) from the effective rate to measure tax avoidance, just like Lee (2021).

Argilés-Bosch *et al.* (2020) use, in addition to GAAP ETR, an indicator established as a difference between the average ETR by country and group of

companies by size (the country- and size-matched ETR) from which they subtract the ETR calling this proxy ABETR (abnormal ETR).

Badertscher *et al.* (2019) considers that GAAP ETR has become a measure of tax evasion generated by the non-compliance between accounting and taxation and proposes another measure of the avoidance, calculated as the ratio between the tax paid and lagged total assets.

An ETR adjustment is used by Shams, Bose and Gunasekarage (2022), based on models found in Guenther, Wilson and Wu (2019) and Balakrishnan Blouin, and Guay (2019): The adjustment is made according to the average ETR, by industry and size. Li, Shevlin and Zhang (2022) adjust both GAAP ETR and cash ETR, by subtracting from these indicators the average ETR per industry of which the firm belongs, on the same quintile, according to the total assets.

The use of ETR to measure tax evasion is very common, but not without criticism. Schwab, Stomberg and Xia (2022) show that the ETR is a tax minimization indicator rather than a tax planning indicator, the latter being more complex and difficult to identify. Also, loss firms cannot provide an ETR, although they may also engage in tax avoidance through other techniques. The ETR also does not allow any distinction to be made between legal and illegal actions taken to reduce taxes (Jimenez-Angueira, 2018).

The easiest way to calculate an ETR is to use annual data. Considering that the strategies for reducing taxes can have long-term effects, in the ETR literature, we find aggregation of annual data for longer periods: 3 years, 5 years or even more. Dyreng, Hanlon and Maydew (2008) believe that a long-term cash ETR (ten years) better measures TA, given that the annual ETR is relatively persistent over time, but this persistence is asymmetric.

ETR can also be analysed in evolution: Platikanova (2017) takes from the literature a variable used as a proxy for overall tax aggressiveness, namely the cash ETR volatility, presented as the change in the standard deviation of cash-effective tax rates over the past five years.

Henry and Sansing (2018), on the assumption that loss companies are economically significant, propose a proxy for that will no longer eliminate these observations. The measure proposed by Henry and Sansing (2018) is based on the tax paid (CTP), from which they subtracted the tax assets corresponding to the existence of tax loss carried forward. The difference between this adjusted tax paid, on the one hand, and the tax rate \times pre-tax income, on the other hand, in relation to the market value of the firm, is a measure of tax avoidance.

Drake, Hamilton and Lusch (2020), collecting manually data from the notes over a period of 20 years, find that the decrease in GAAP ETR over time, for US companies, is largely explained by the evolution of the valuation allowances of assets, and by the losses carried forward; this means that the decrease in ETR is not necessarily the result of tax-minimizing strategies, but rather the result of economic changes suffered by the company.

Sometimes the ETR is multiplied by -1, so that the meaning of the change is the same for the variables analysed (Khan, Srinivasan and Tan, 2017; Hasan *et al.*, 2017; Hasan, Habib and Alam, 2021).

3. BOOK-TAX DIFFERENCES

Book-tax gap (BTG) or book-tax differences (BTD) are usually set as the difference between book income profit and taxable income. The latter is not usually accessible in company reports, but is reconstituted by dividing the current income tax expense by the STR.

Graham, Raedy and Shackelford (2012) present two types of differences: temporary and permanent. Hanlon, Krishnan and Mills (2012) retain total, temporary and permanent BTD. Armstrong, Blouin and Larcker (2012) consider that BTG reflects both the tax planning in accordance with the rules and the one that leaves the current tax rules.

Starting from BTD, Desai and Dharmapala (2006) propose a new proxy for TA: the BTD component that cannot be attributed to accounting accruals. The fiscal aggressiveness is measured by Ying, Wright and Huang (2017) as a residual of a regression in which the dependent variable is the BTD, and the independent variables are current period investment income, interest income, operating expenses, operating profit before interest and tax, profit before tax.

Tang and Firth (2012) separate BTD into normal BTD and abnormal BTD. ABTD are the unexplained part (the residual) arising in a regression that makes the current year's BTD variable dependent on investment in assets, income variation, accounting loss, deferred tax loss, the difference between the parent's tax share and the average share of subsidiaries and BTD in the previous year.

Bringing together ETR and BTD, Atwood *et al.* (2012) propose the following TA indicator (PTEBX = profit before tax, τ = STR, CTP = current tax expense):

$$TA = \frac{PTEBX \times \tau - CTP}{PTEBX} \quad (1)$$

Like the ETR, the BTD does not allow any distinction to be made between legal and illegal actions taken to reduce payment taxes (Jimenez-Angueira, 2018).

Other proxies for tax avoidance

Chan, Luo and Mo (2016) measure this the tax non-compliance through tax audit adjustments, book-tax compliance and book-tax differences.

Richardson, Taylor and Lanis (2016) propose as a proxy for fiscal aggressiveness, the involvement of companies in litigation with tax authorities, following a tax audit.

Tax shelter, without being illegal, result in very important tax savings for the companies that apply them and thus reductions in state tax revenues, even if it is an expensive strategy (Khan, Srinivasan and Tan, 2017). Chi, Huang and Sanchez (2017) calls corporate tax sheltering the most aggressive form of tax minimization strategies, and Gallemore, Maydew and Thornock (2014) place this form of tax

optimization at the extreme spectrum of TA strategies. Wilson (2009) argues that an increase in BTD may indicate an even greater increase in the likelihood of the firm's involvement in tax sheltering. As a proxy for tax sheltering, Gallemore, Maydew and Thornock (2014) use the existence in the press of articles about the involvement of the company in such montages.

Armstrong *et al.* (2015) use unrecognized tax benefits (UTB) as a proxy to measure tax evasion and designate it as: „management's estimate of the amount of tax savings generated by tax planning that is potentially payable to the tax authorities upon audit”. To measure fiscal aggression, Law and Mills (2015) uses four proxies, including UTB balances. UTB is, however, a US-specific variable, where accounting rules require such an estimate to be presented in the financial statements.

The part TA called conforming TA is measured by Hjelstrom *et al.* (2020) as the residual of a regression in which the dependent variable is the ratio of the tax paid to ln(total assets) and the independent variables are BTD, the existence of loss, sales divided by net operating assets and the existence of operating loss.

Tax avoidance/tax evasion has an important component of profit shifting. DeSimone, Mills and Stomberg (2019) consider that this mode of transfer of profits is not defined in a complete manner in literature, but that it can be presented as a change in the place where the profit is reported. The transfer of profits to other jurisdictions cannot be measured with great certainty, so the literature proposes various proxies to identify the use of this aggressive tax planning mechanism. Klassen and Laplante (2012) point out that, in order to measure the incentives a firm has to transfer profits to other territories, the literature proposes a proxy established on the basis of the difference between the statutory tax rate in the country of residence of the parent company and the tax rates in the foreign territories where the subsidiaries are located. For this latter size, a weighted average is used; it is also possible to use cumulative data over several years. The formula in Klassen and Laplante (2012) is as follows:

$$AvgFTR = \frac{\sum_{m=0}^4 TE_{f,t-m}}{\sum_{m=0}^4 PTI_{f,t-m}} - \frac{1}{5} \times \sum_{m=0}^4 STR_{US,t-m} \quad (2)$$

where: FTR = annual incentive to shift income, $TE_{f,t}$ is the tax expense reported for the foreign jurisdictions for period t, $PTI_{f,t}$ is the pretax income reported for the foreign jurisdictions for period t, $STR_{US,t}$ is the statutory corporate tax rate for the United States for period t.

Delis, Hasan and Karavitis (2019) find significant profit-shifting activities on the part of multinationals, in the case of subsidiaries established in countries with low tax-rate uncertainty; on the contrary, the debt shifting is statistically shown to be significant also in the case of subsidiaries in high-tax-uncertainty countries. DeSimone, Mills and Stomberg (2019) use a variable to measure net flows between US companies and their overseas subsidiaries to measure income

shifting, but warn us that this technique of transferring profits is not just tax-motivated.

In an attempt to separate TA generated by the different tax rates in the states where the subsidiaries of a group are located from the TA generated by the decrease in the tax base in each country, Lampenius Shevlin and Stenzel (2021) propose an average STR which takes into account national statutory rates and reconstituted taxable income reported in each country; this ASTR may measure the avoidance generated by the different tax rates applied by the subsidiaries. For the tax base TA component, Lampenius Shevlin and Stenzel (2021), propose a reconstruction of BTD as a difference between accounting and taxable profit, the latter being the tax expense divided by ASTR.

Kim *et al.* (2022) use as a proxy for investments in tax planning the fees paid to external fiscal consultants. Guenther, Wilson and Wu (2019) propose an indicator called rate of tax avoidance, by which they designate the part of the pre-tax income that is not paid as a profit tax. Among the four proxies used to identify fiscal aggressiveness, Law and Mills (2015) propose the presence in tax havens, as well as the obligation to make adjustments as a result of tax audit (in addition to UTB and ETR)

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DETECT THE TENTATIVE BEFORE BECOMING REAL:
A MACHINE LEARNING APPROACH FOR PHISHING EMAIL
DETECTION IN ROMANIAN HEALTHCARE

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Abstract

Phishing attacks pose a significant threat to individuals and organizations, and their accurate and effective detection is crucial to preventing data breaches and financial losses. With the increasing use of email as a communication channel, phishing attacks have become more widespread and sophisticated. Our study addresses the use of machine learning-based models to detect phishing emails by analyzing the text of the message. A characteristic of the study is given by the fact that it uses a dataset composed of private emails in Romanian, obtained from public institutions in the field of health. Since the models were applied to the text, natural language processing techniques specific to the Romanian language were used to extract the features. The results obtained highlighted that some models outperform others in terms of accuracy, underlining the importance of choosing a machine learning approach for phishing detection in a given language. The conclusions of this study can support research for the development of effective phishing detection tools for Romanian-speaking users and organizations.

Keywords: *phishing detection; machine learning; healthcare; Romania.*

JEL Classification: O310.

1. INTRODUCTION

Technologies are always and constantly advancing with the aim of improving some social or economic aspects. At the same time, the digitalization of society has created an increasing dependence on technology. Organizations in the health field, and not only, have greatly benefited from this technological advance. And they rely on a backbone of connected computing infrastructures and mobile medical devices that use patient-oriented technologies. In addition, healthcare professionals rely on electronic medical records, computer-controlled medical

devices, complex medical imaging platforms, and a multitude of other tools to support the current standard of care.

Although technological advances are visible and tangible, new vulnerabilities and threats, both physical/psychological and cyber, are periodically identified with an impact in the health field. Thus, the last period was marked by a pandemic threat, which, in addition impose some social and professional changes, such as telework, movement or socialization restrictions, put a high pressure on the digital infrastructure. And these changes, combined with the geopolitical changes that generate a constant dose of mistrust, , have led to the creation of a continuous insecurity condition. The insecurity is the main factor to threats manifestation, some of which are even cybercrimes.

Against this background of insecurity, prevention, mitigation, emergency management and disaster recovery are important responsibilities in most fields, especially in health. And the high degree of dependence of the health system on technology presents a new and important challenge for doctors, experts and decision makers.

Healthcare organizations are currently considered some of the most vulnerable when it comes to cyber threats. According to a report by the Ponemon Institute (Ponemon Institute, 2022), the estimated average cost of a data breach in the healthcare sector is \$4.82 million. Furthermore, a report by IBM X-Force (IBM, 2023) found that healthcare organizations were among the top targets for cyberattacks in the period 2020-2022, with a percentage that varied between 6.6% and 5.8%.

One of the main reasons of medical organizations vulnerabilities to cyberthreats is the large amount of sensitive information managed by these, such as patient medical records, which can be sold on the dark web at a high price (Davis, 2021). Additionally, they are often targeted by hackers as they may have weaker security systems than other industries and users may be more prone to phishing attacks.

The healthcare industry faces several challenges when it comes to cybersecurity. One of the main challenges is the complexity of the systems and infrastructure used by healthcare organizations. Systems often rely on a wide range of devices and technologies, including medical devices, electronic health records and mobile devices. This complexity makes it difficult to implement comprehensive cybersecurity measures (HIMSS, 2023).

Another challenge is the lack of cybersecurity professionals. In 2022, a cybersecurity workforce study (ISC2, 2022), found that there is currently a deficit of 3.4 million skilled cybersecurity professionals globally. And all this only turns the organizations in the mentioned field into a continuous target of cyberattacks. In fact, according to a study, the attacks, carried out in 2021, on organizations in the medical field in the USA led to the compromise of more than 40 million patient files (Jercich, 2021).

Practically, with technological development it has become almost impossible to eliminate security risks for modern information systems. Given the many challenges posed by new ways of conducting cyberattacks, statistical data analysis, natural language processing and Machine Learning (ML) are increasingly used techniques in cyber security and data privacy challenges. (Ali *et al.*, 2020). Thus, identifying a way to recognize and obtain relevant information for integration into data sets that can be used in empirical analysis or probability theory (Makawana and Jhaveri, 2018) has become a major utility for cybersecurity systems.

The purpose of this study is to identify the optimum ML model in the Supervised Learning category, that can be used to detect email messages in the phishing category. The choice to detect phishing attacks is given both by their constantly growing percentage and by the fact that it represents the most common method used for unauthorized access. The novelty of the solution is given by the fact that the dataset used will contain characteristics extracted from the subject and the text of the message, which will be in Romanian.

The methodological approach is quantitative/experimental by exposing the way to apply Machine Learning algorithms, presenting the activities performed and analysing the results.

In this sense, chapter 2 aims to expose the importance of detecting attacks in the phishing category, considering the role they play in supporting other types of attacks, respectively their effects.

In chapter 3, we will consider the identification of an optimal solution for the application of ML to detect phishing attacks through email messages, by applying a methodology that requires a combination of data collection and pre-processing, selection of features, respectively training and evaluation of some models.

2. CYBERATTACKS, THREATS THAT CONTINUE TO EXCEED VIRTUAL BOUNDARIES

Cyberattacks are those activities carried out by malicious individuals or groups, through the use of computer systems, which aim to disrupt, damage or gain unauthorized access to a target system or network. These can take many forms, including malware/ransomware infections, phishing scams, denial-of-service attacks, and more.

According to a report issued by ENISA, in 2022 (ENISA, 2022), the main threats identified at European level, to cyber security, were the following:

1. Ransomware – a threat in which certain situations are encrypted and an organization's data is exfiltrated, and a payment is requested to restore access.
2. Malware – threat represented by software or firmware designed specifically to perform unauthorized activities that negatively impact the confidentiality, integrity, or availability of a system.

3. Social Engineering threats – threats that exploit the weak points of the human psyche and everyday habits rather than the technical vulnerabilities of information systems.

4. Threats against data – threats that allow the exfiltration of important and protected data, being on an upward trend, because one of the main targets for attackers is to access sensitive data for negative reasons like ransom, defamation, extortion, disinformation, etc.

5. Threats against availability and integrity – Availability and integrity are the target of a multitude of threats and attacks, among which Denial of Service (DoS) and Web Attacks stand out.

6. Disinformation / Misinformation – Disinformation campaigns by spreading false or partially false information are on the rise. They are supported by the increased use of social media platforms and online media, as well as the increase in people's online presence. They are used in hybrid attacks to reduce the overall perception of trust, a major enabler of cybersecurity.

7. Supply-chain attacks – Threats representing a combination of at least two attacks. The first attack is on a digital service/product provider which is then used to attack the targeted target(s) in order to gain access to internal resources.

Additionally, the SOPHOS report for the year 2022 (Sophos, 2022) reinforces the fact that among the main threats remain Ransomware/Malware and e-mail related threats, but draws attention to the fact that there is an upward trend aimed at IoT and AI.

According to different studies in the area of cyber security, a cyberattack is carried out in several stages. Their number varies between 5 (Goedegebure, 2017), 6 (PaloAlto, 2023) and 7 (Lockheed Martin, 2023) and even 14 (Jackson, 2022). In this sense it can be generalized that an attack consists of the main important steps: Recognition, Scanning, Gaining Access, Maintaining Access and Concealing unauthorized presence.

An analysis of these stages reveals that they begin with the Recognition stage, during which the available information about the target system is collected. Later, the information obtained is used to initiate the actual attack in the next stage, where we encounter various types of attacks, the most prevalent being through phishing campaigns.

Phishing, a tool for exploiting human vulnerability

Phishing is a type of cyberattack in which hackers or cybercriminals try to trick people into revealing sensitive information, such as personal data, login credentials or financial information. Phishing attacks can be conducted via email, text messages, social media or other communication channels.

Phishing attacks often involve creating fake websites or login pages that mimic legitimate websites or services. For example, a phishing email may appear to come from a bank or social media platform and contain a link to a fake login

page that looks like the real thing. When the victim enters their credentials, the information is sent to the attacker, who can then use it for malicious purposes (FTC, 2022).

Phishing attacks can also involve the use of social engineering techniques, such as creating a sense of urgency or fear in the victim, to increase the likelihood that they will divulge sensitive information (Porter, 2021). For example, a phishing email may claim that the victim's account has been compromised and that they must change their password immediately or risk losing access to their account.

Phishing has become one of the most common cyber threats overall, with 81% of organizations affected in 2022 (Jones, 2023), and healthcare organizations are no exception. Phishing can range from mass email campaigns designed to get recipients to reveal their passwords or access malicious applications delivered in the form of seemingly legitimate documents, to highly targeted campaigns designed to get invoice payments false.

A 2022 study (Ell and Gallucci, 2022) found that 26% of organizations experienced a "significant" increase in the number of email threats in 2021, and of these, 88% were victims of ransomware. Also, at least one business email has been compromised in 92% of organizations, and 93% have experienced data breaches due to negligence or compromised employee credentials. According to other studies, during the peak period of the COVID-19 pandemic, phishing attacks increased by 220% (Warburton, 2020) and as a result of the Russian-Ukrainian conflict, an intensification of phishing attacks targeting organizations was identified from NATO member countries (Huntley, 2023). Moreover, in 2022, 48.63% of all emails globally were spam, an increase of 3 percent compared to 2021, when only 45.56% of emails sent were spam (Kulikova *et al.*, 2023).

Traditional phishing detection approaches rely on predefined rules and heuristics. These approaches are effective, but they are not scalable and cannot detect new and complex attacks. Machine Learning (ML) has become an innovative way with high possibilities for detecting phishing attacks. ML models can learn from data and detect previously unseen attacks, making them an effective solution to the problem.

The key to successfully detecting phishing is to identify tentative attacks before they become real. ML models can identify tentative attacks based on features such as email sender, subject line, body content, and URL.

The key to successfully detecting a cyberattack is to identify tentative attacks like phishing before they become real. Machine Learning (ML) models can be successfully used to identify phishing attacks based on features such as email sender, subject line, body content, and URL.

3. ML-BASED SOLUTION FOR IDENTIFYING PHISHING EMAIL MESSAGES

Phishing detection can be approached using various ML techniques, including sentiment analysis, content analysis, and sender and URL analysis.

In general, detection of phishing emails can be done by two main types of methods: black/white list and ML. The first uses a predefined list of phishing or legitimate addresses that are compared to indicators in the received email, such as the sender's email address or IP address. Depending on the degree of data matching and the list used, the phishing email is rejected before reaching the email server (Khonji, Iraqi and Jones, 2013; Gupta, Arachchilage and Psannis, 2018). In general, the blacklisting method has a low false positive rate. However, the method depends on recipients reporting phishing emails (Fang *et al.*, 2019). On the same note, automatic whitelisting is also up to the user to create a collection of legitimate addresses. Whitelisting can be used to prevent phishing emails, but it is not effective enough to detect all phishing attacks due to the high percentage of false negatives (Jain and Gupta, 2019). Regardless of the list type, they do not provide security against zero-day attacks, as the details of new email addresses or URLs cannot be known.

Alternatively, ML can streamline the automated detection of phishing emails through various methods. In this sense, two methods for improving the classifier have been proposed in studies in the field (Toolan and Carthy, 2010):

- 1) testing and evaluating multiple ML models;
- 2) improving the classifier by focusing on feature selection from the dataset.

This article proposes a solution for detecting phishing e-mail messages targeting medical organizations in Romania. In the development of the solution, the Python programming language was used together with specific ML libraries (pandas, scikit-learn, numpy etc.) and the following stages were completed:

1. Data collection and preparation: In this step, the data is obtained and prepared for use by the ML models.
2. Feature extraction: This step consists in extracting the relevant features for running the ML models. During this stage, necessary actions such as dimensionality reduction or feature scaling are carried out
3. Model selection and training: Involves choosing an ML model and applying it to previously extracted features.
4. Model evaluation: After the training stage, the model is tested on a separate data set and evaluated in terms of performance.

3.1. Data collection and preparation

Currently, for the training and evaluation of ML models, datasets containing features extracted from email messages from the phishing category are available. But the messages come from various sectors of activity and are in English, which is why we considered the possibility that the phishing messages aimed at the

health field in Romania present certain specific characteristics. Thus, 292 raw phishing e-mails collected between 2020 and 2023 from 3 healthcare organizations were processed in a dataset. These represent only the messages that were not detected by the primary security solutions implemented by the respective institutions, in their own email servers. For the legitimate part of the data set, 208 messages collected from the 3 health organizations in Romania were used. The data were made available for research purposes only, not being public.

Therefore, in total, the dataset contains 440 emails, and of these, 47% are legitimate. To go through all the email files of type “.eml” and extract the features, the Python library, “email” was used. From all the available data, only those containing the subject and the message were extracted. Thus, those that contained details on email addresses or details on attached files were discarded because they are not relevant for the following reasons:

- An email address may contain truthful details as a sign of the existence of spoofing tools.
- If the same email address is used, it will be blacklisted at some point.
- The details of the attached files are relevant only by knowing the hash, an aspect that would require downloading it and implicitly the possibility of system vulnerability.

The dataset consists of features grouped into a text variable and represents word lists specific to each message and a label variable, for Supervised Learning models, indicating whether the email is phishing („Phish”) or legitimate („NonPhish”).

3.2. Features extraction

The features represent a list of the most frequent terms, extracted from phishing and legitimate emails, the selection of which has been widely applied in the data-mining literature. A series of steps were followed to construct the phishing dataset, described below.

The first step consisted of grouping the messages into two categories: phishing and legitimate. Each category was parsed and only the information contained in the subject and body of the email was extracted. Later, from the extracted data, tags and html elements, URLs, were removed, because they can be used by other phishing detection models that consider their examination, respectively "stop words". "Stop words" represent a list of words that are filtered out before or after processing natural language (text) data because they are meaningless (Rajaraman and Ullman, 2011). For this action, the Python library, NLTK's stop words corpus, was used, because it contains "stop words" in Romanian as well.

Finally, we used TF-IDF (Term Frequency Inverse Document Frequency) from scikit-learn library for Python. This tool finds the most frequent terms that appear in the corpus. It calculates the number of times a word appears in a

document multiplied by a (monotonic) function of the inverse of the number of documents in which the word appears. A higher weight is given to the terms that appear often in a document and do not appear in many documents (Berry, 2004).

3.3. Model selection and training

After preparing the data set, the following algorithms from the Supervised Learning category were applied to it: Logistic Regression, Multinomial Naive Bayes, Random Forest, Decision Tree Classifier, Support Vector Classifier, K-Neighbors Classifier, MLP Classifier, Neural Networks, Gradient Boosting and Add Boost.

a) *Logistic Regression*: It is a linear model used for binary classification tasks. It works by estimating the probability of an email being phishing based on a set of input features. It is simple to implement, interpretable, and can handle large datasets (Cunningham, Cord and Delany, 2008).

b) *Multinomial Naive Bayes*: Represents a probabilistic model, used often for text classification tasks. It works by estimating the probability of an email being phishing or legitimate based on the occurrence of words or phrases in the email. It is simple to implement, computationally efficient, and can handle large datasets (Cunningham, Cord and Delany, 2008).

c) *Random Forest*: It is an ensemble model used for classification and regression tasks. It builds a large number of decision trees and combine their predictions to obtain a more accurate and robust final prediction. It is less prone to overfitting than decision trees and can handle high-dimensional data (Nasteski, 2017).

d) *Decision Tree Classifier*: It is a tree-based model that is used for classification tasks. It works by partitioning the feature space into smaller regions based on the input features and making decisions based on the majority class in each region. It is interpretable and can handle both categorical and numerical data (Cunningham, Cord and Delany, 2008).

e) *Support Vector Classifier*: It is a model that is used for binary classification tasks. It works by finding a hyperplane that maximally separates the two classes in the feature space. It is effective in high-dimensional spaces and can handle nonlinear decision boundaries (Nasteski, 2017).

f) *K-Neighbors Classifier*: It is a lazy learning model that is used for classification tasks. It works by finding the k nearest neighbors to a new data point in the feature space and making a prediction based on the majority class of the neighbors. It is simple to implement and can handle both categorical and numerical data (Nasteski, 2017).

g) *MLP Classifier*: It is a neural network model that is used for classification tasks. It works by learning a nonlinear function that maps the input features to the output classes. It is effective in high-dimensional spaces and can handle nonlinear decision boundaries (Windeatt, 2008).

h) *Neural Networks*: It is a deep learning model that is used for both classification and regression tasks. It works by learning a hierarchy of nonlinear features from the input data and making predictions based on the learned features. It is effective in high-dimensional spaces and can handle complex data (Freeman and Skapura, 1991).

i) *Gradient Boosting*: It is an ensemble model that is used for classification and regression tasks. It works by building an ensemble of weak prediction models and combining their predictions to form a more accurate and robust final prediction. It is less prone to overfitting than other ensemble models and can handle high-dimensional data.

j) *Ada Boost*: It is an ensemble model like Gradient Boosting and works by building an ensemble of weak prediction models and adjusting their weights to focus on misclassified examples. It is less prone to overfitting than other ensemble models and can handle complex data (Bahad and Saxena, 2020).

The algorithms were applied on 5 randomly generated training sets. The results are presented in (Table 1) together with the value of the confusion matrix indicators (TN-True Negative; FP-False Positive; FN- False Negative; TP- True Positive;). It should be noted that the results are related to the confusion matrix indicators and represent the following:

1. *Precision*: This metric measures the proportion of true positive predictions out of all positive predictions. It is useful when the cost of false positives is high. The formula for calculating Precision is: $TP / (TP + FP)$.

2. *Recall*: This metric measures the proportion of true positive predictions out of all actual positives. It is useful when the cost of false negatives is high. The formula for calculating Recall is: $TP / (TP + FN)$.

3. *F1 Score*: This is the harmonic mean of precision and recall, and provides a balanced measure between the two metrics. The formula for calculating F1 Score is: $2 * (Precision * Recall) / (Precision + Recall)$.

4. *Accuracy*: This metric measures the proportion of correctly classified instances out of all instances. It is a simple and commonly used metric, but can be misleading if the data is imbalanced. The formula for calculating Accuracy is: $(TP + TN) / (TP + TN + FP + FN)$.

Table 1. The results of applying ML models

Model	Training set	Precision	Recall	F1-score	TN	FP	FN	TP	Accuracy
Logistic Regression	1	0.89	0.78	0.83	63	6	14	49	0.8485
	2	0.81	0.92	0.86	55	14	5	58	0.8561
	3	0.77	0.95	0.85	51	18	3	60	0.8409
	4	0.75	0.95	0.84	49	20	3	60	0.8258

Model	Training set	Precision	Recall	F1-score	TN	FP	FN	TP	Accuracy
	5	0.89	0.78	0.83	63	6	14	49	0.8485
Multinomial Naive Bayes	1	0.86	0.87	0.87	60	9	8	55	0.8712
	2	0.78	0.95	0.86	52	17	3	60	0.8485
	3	0.8	0.95	0.87	54	15	3	60	0.8636
	4	0.73	0.95	0.83	47	22	3	60	0.8106
	5	0.86	0.87	0.87	60	9	8	55	0.8712
Random Forest	1	0.89	0.81	0.85	63	6	12	51	0.8636
	2	0.81	0.95	0.88	55	14	3	60	0.8712
	3	0.76	0.97	0.85	50	19	2	61	0.8409
	4	0.74	0.95	0.83	48	21	3	60	0.8182
	5	0.88	0.79	0.83	62	7	13	50	0.8485
Decision Tree Classifier	1	0.75	0.79	0.77	52	17	13	50	0.7727
	2	0.82	0.78	0.8	58	11	14	49	0.8106
	3	0.86	0.79	0.83	61	8	13	50	0.8409
	4	0.82	0.79	0.81	58	11	13	50	0.8182
	5	0.76	0.89	0.82	51	18	7	56	0.8106
Support Vector Classifier	1	0.91	0.79	0.85	64	5	13	50	0.8636
	2	0.88	0.89	0.88	61	8	7	56	0.8864
	3	0.77	0.95	0.85	51	18	3	60	0.8409
	4	0.77	0.94	0.84	51	18	4	59	0.8333
	5	0.94	0.81	0.87	66	3	12	51	0.8864
K-Neighbors Classifier	1	0.83	0.87	0.85	58	11	8	55	0.8561
	2	0.78	0.89	0.83	53	16	7	56	0.8258
	3	0.79	0.84	0.82	55	14	10	53	0.8182
	4	0.78	0.89	0.83	53	16	7	56	0.8258
	5	0.82	0.89	0.85	57	12	7	56	0.8561
MLP Classifier	1	0.86	0.87	0.87	60	9	8	55	0.8712
	2	0.83	0.87	0.85	58	11	8	55	0.8561
	3	0.84	0.89	0.86	58	11	7	56	0.8636
	4	0.8	0.89	0.84	55	14	7	56	0.8409
	5	0.87	0.84	0.85	61	8	10	53	0.8636

Model	Training set	Precision	Recall	F1-score	TN	FP	FN	TP	Accuracy
Neural Networks	1	0.87	0.87	0.87	61	8	8	55	0.8788
	2	0.82	0.87	0.85	57	12	8	55	0.8485
	3	0.81	0.9	0.86	56	13	6	57	0.8561
	4	0.81	0.89	0.85	56	13	7	56	0.8485
	5	0.87	0.87	0.87	61	8	8	55	0.8788
Gradient Boosting	1	0.82	0.81	0.82	58	11	12	51	0.8258
	2	0.87	0.83	0.85	61	8	11	52	0.8561
	3	0.87	0.87	0.87	61	8	8	55	0.8788
	4	0.84	0.83	0.83	59	10	11	52	0.8409
	5	0.83	0.83	0.83	58	11	11	52	0.8333
Ada Boosting	1	0.88	0.83	0.85	62	7	11	52	0.8636
	2	0.8	0.83	0.81	56	13	11	52	0.8182
	3	0.84	0.81	0.82	59	10	12	51	0.8333
	4	0.85	0.81	0.83	60	9	12	51	0.8409
	5	0.92	0.86	0.89	64	5	9	54	0.8939

Source: self-representation

3.4. Model evaluation

For the evaluation of the effectiveness of a classifier are commonly used two methods: the *holdout* method and the *k-fold cross-validation* method (Rithchie, 2018).

In a holdout split, the classifier is evaluated by computing the error rate. The error rate is calculated by comparing the predicted labels to the true labels in the validation set. The error rate is typically defined as the number of incorrect predictions divided by the total number of predictions.

In the k-fold cross-validation method the data is split into k-folds. Each fold is a subset of the data that will be used as the validation set for one iteration of the cross-validation process. The classifier is evaluated by the average performance of model across all k-folds

In this study were used both methods, for the evaluation. For the tested models, 70% of the data was used for training (308 rows), while 30% for testing (132 rows).

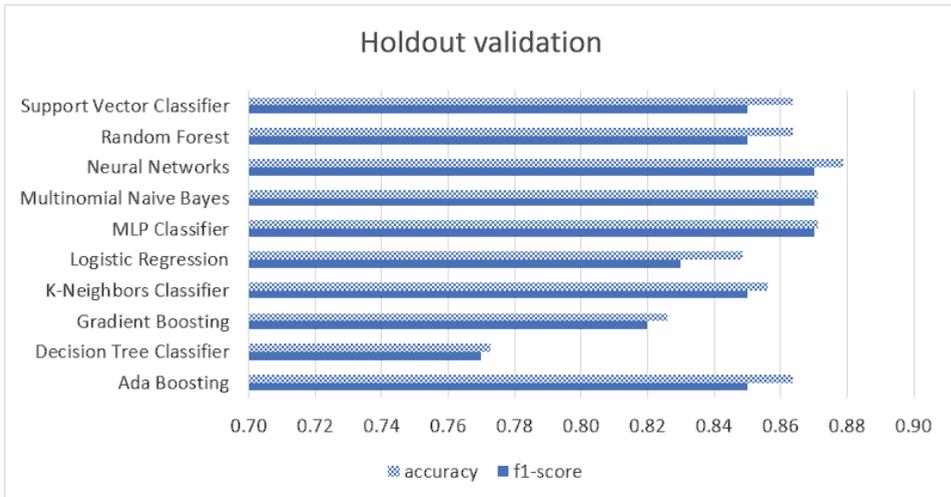
Moreover, the cross-validation method was used, dividing the data set into 5 groups. The model is trained 5 times, with different test set, the results obtained for each set being those in (Table 1).

In the case of the evaluation by the holdout method, the results obtained are those from (Table 2), the graphic representation being in (Figure 1). According to them, the highest percentage of accuracy and implicit detection of phishing email messages is obtained by Neural Networks (87.88%), followed by MLP Classifier and Multinomial Naïve Bayes, both with a percentage of 87.12%. Also, as expected, Neural Networks has lower error rate (12.12%)

Table 2. Holdout evaluation

Model	Precision	Recall	F1-score	Accuracy	Err rate
Ada Boosting	0.8800	0.8300	0.8500	0.8636	0.1364
Decision Tree Classifier	0.7500	0.7900	0.7700	0.7727	0.2273
Gradient Boosting	0.8200	0.8100	0.8200	0.8258	0.1742
K-Neighbors Classifier	0.8300	0.8700	0.8500	0.8561	0.1439
Logistic Regression	0.8900	0.7800	0.8300	0.8485	0.1515
MLP Classifier	0.8600	0.8700	0.8700	0.8712	0.1288
Multinomial Naive Bayes	0.8600	0.8700	0.8700	0.8712	0.1288
Neural Networks	0.8700	0.8700	0.8700	0.8788	0.1212
Random Forest	0.8900	0.8100	0.8500	0.8636	0.1364
Support Vector Classifier	0.9100	0.7900	0.8500	0.8636	0.1364

Source: self-representation



Source: self-representation

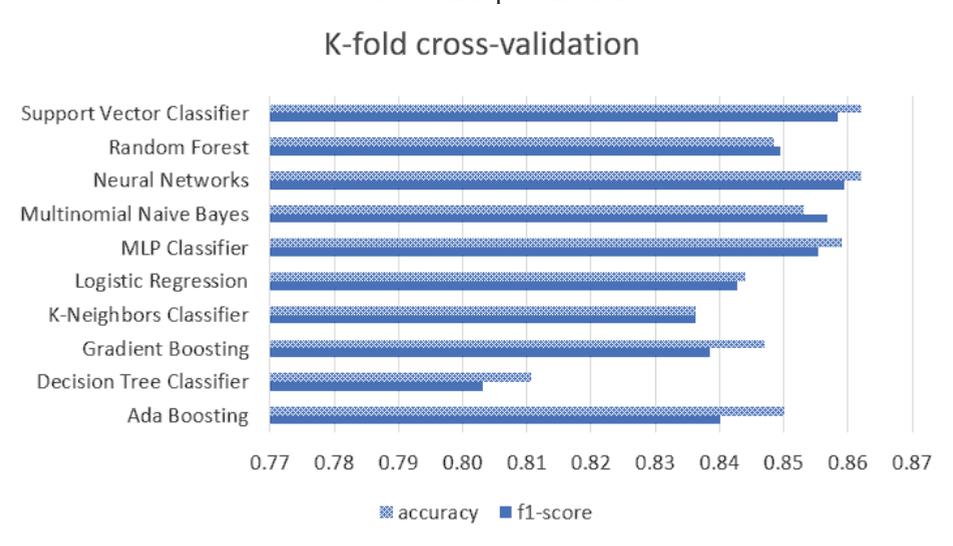
Figure 1. Graphical representation of accuracy and f1-score for holdout evaluation

In the case of the evaluation by the k-fold method, the results obtained are those in (Table 3), the graphic representation being in (Figure 2). According to them, the highest percentage of accuracy and implicit detection of phishing email messages is obtained by Support Vector Classifier and Neural Networks, both with 86.21%.

Table 3. K-fold cross validation evaluation

Model:	Precision	Recall	F1-score	Accuracy
Ada Boosting	0.8553	0.8254	0.8401	0.8500
Decision Tree Classifier	0.7969	0.8095	0.8031	0.8106
Gradient Boosting	0.8452	0.8317	0.8384	0.8470
K-Neighbors Classifier	0.8000	0.8762	0.8364	0.8364
Logistic Regression	0.8118	0.8762	0.8427	0.8439
MLP Classifier	0.8384	0.8730	0.8554	0.8591
Multinomial Naive Bayes	0.8011	0.9206	0.8567	0.8530
Neural Networks	0.8373	0.8825	0.8594	0.8621
Random Forest	0.8080	0.8952	0.8494	0.8485
Support Vector Classifier	0.8415	0.8762	0.8585	0.8621

Source: self-representation



Source: self-representation

Figure 2. Graphical representation of accuracy and f1-score for k-fold cross-validation evaluation

Based on achieved results, the Neural Networks model can be proposed, as a possible solution for detecting phishing e-mail messages written in Romanian and

aimed at health organizations. However, the accuracy percentage obtained, below 90%, reveals the need to continue the study by extracting other characteristics, namely the identification of terms specific to this type of message, in order to increase the robustness of the cyber security solution.

4. CONCLUSIONS

Email phishing attacks are one of the fastest growing cybercrimes, targeting both organizations and individuals. Also, according to estimates, annual losses are in the order of billions of dollars. The methods by which these attacks are carried out change rapidly, also depending on the level of knowledge of the attacker. Thus, to compete with human intelligence, a perfect or at least perfectible solution is given by the application of ML models.

The main goal of this study is to propose a possible solution for increasing the level of performance and accuracy of the classification and detection of phishing e-mails written in Romanian. Within it, the results of the classification models for the detection of phishing e-mails in Romanian were examined, using natural language processing tools and supervised learning models.

The solution highlights the importance of examining text features in the email message as it represents a new research direction in email phishing detection.

The neural networks model that achieved the highest percentage of accuracy reveals that in the analysis of texts should be approached models from the category artificial neural networks. Also, given that the research is an early one, it will be necessary to approach some models of deep learning to identify phishing attacks in the text of the messages written in Romanian. There is a possibility that this research is among the first, to our knowledge, that examined and compared several models for detecting phishing in an e-mail with content in Romanian. This will lead to more investigations into detecting phishing in text, whether in emails, social media messages or even malicious websites.

Moreover, the proposed solution is an early one and can be improved by diversifying the features, in order to increase the accuracy for detecting phishing attacks. Thus, the aim is to increase the efficiency in detecting unknown or zero-day attacks.

Future research directions will aim to improve the solution by applying the models to different types of characteristics extracted from the message text, respectively the identification of hybrid models with a high degree of accuracy in identifying this type of attack.

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HARNESSING AI TO OPTIMIZE INTERFACE DESIGN: A COMPARATIVE ANALYSIS OF TASK COMPLETION TIME ACROSS INTERFACE TYPES

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Abstract

This article investigates the potential of artificial intelligence (AI) in optimizing interface design to enhance task completion time across various types of interfaces. By examining the characteristics, strengths, and weaknesses of each interface type and the potential integration of AI, we aim to provide insights into how AI can be leveraged to improve user experience and task efficiency. We will discuss the influence of AI on Graphical User Interfaces (GUIs), Command Line Interfaces (CLIs), Voice User Interfaces (VUIs), Gesture-based Interfaces, Haptic Interfaces, and Mixed Reality Interfaces (Augmented Reality and Virtual Reality). Through a review of existing research and case studies, we explore the current state of AI integration in interface design and future opportunities for enhancing task completion time and overall system usability.

Keywords: *artificial intelligence; interface design; task completion time; user experience.*

JEL Classification: O33, M15.

1. INTRODUCTION

The rapid development and adoption of artificial intelligence (AI) across various industries have opened up new opportunities for innovation and optimization in the field of interface design. As users increasingly rely on digital platforms for communication, work, and entertainment, the need for efficient and user-friendly interfaces becomes paramount. Interface design plays a crucial role in determining the effectiveness and usability of digital systems, with task completion time being a key metric in evaluating overall user experience.

In this article, we aim to examine the potential of harnessing AI technologies to optimize interface design, focusing on the impact of AI integration on task completion time across different types of interfaces. The growing presence of AI in interface design has led to the emergence of smart, adaptive, and context-aware systems that can cater to the unique needs and preferences of individual users. By providing personalized and intelligent solutions, AI-driven interfaces can enhance the user experience, streamline task completion, and improve system efficiency.

To gain a comprehensive understanding of the potential of AI in optimizing interface design, we will first discuss the characteristics, strengths, and weaknesses of various interface types, including Graphical User Interfaces (GUIs), Command Line Interfaces (CLIs), Voice User Interfaces (VUIs), Gesture-based Interfaces, Haptic Interfaces, and Mixed Reality Interfaces (Augmented Reality and Virtual Reality). We will then explore the current state of AI integration in these interfaces, drawing upon existing research and case studies to highlight the ways in which AI technologies are being employed to enhance task completion time and overall usability.

In doing so, we aim to provide insights into the future of interface design, demonstrating the potential of AI technologies to revolutionize the way users interact with digital systems and facilitate more efficient, enjoyable, and productive user experiences. By examining the impact of AI on various interface types, this article contributes to the growing body of research on the role of AI in enhancing the usability and effectiveness of digital systems, offering valuable insights for designers, developers, and researchers alike.

2. MATERIALS AND METHODS

The main research questions addressed in this study are: 1) How do different types of interfaces affect task completion time? 2) How does the type of user interface affect task completion time for different types of tasks and users? 3) How does the type of user interface affect task completion time in different contexts? These questions were investigated through a comprehensive literature review, case study analysis, and comparative assessment of the potential impact of AI in optimizing interface design. By examining the characteristics, strengths, and weaknesses of each interface type and the potential integration of AI, we aim to provide insights into how AI can be leveraged to improve user experience and task efficiency across different interface types and contexts.

Literature Review

A comprehensive literature review was conducted to gain an understanding of the current state of AI in interface design and its impact on task completion time. We explored scholarly articles, conference proceedings, and industry reports to identify relevant research on AI applications in interface design, as well as studies focused on the evaluation of task completion time across different types of interfaces. The literature review provided insights into existing AI techniques, tools, and platforms employed in interface design, and highlighted the strengths and weaknesses of each interface type concerning task completion time.

Case Study Analysis

To further assess the real-world impact of AI integration in interface design, we examined a selection of case studies that demonstrated the application of AI technologies in various interface types. These case studies showcased successful AI implementations in GUIs, CLIs, VUIs, Gesture-based Interfaces, Haptic

Interfaces, and Mixed Reality Interfaces. We analyzed the case studies to understand how AI-driven solutions contributed to improved task completion time, user satisfaction, and overall system usability.

Comparative Assessment

Using the insights gained from the literature review and case study analysis, we conducted a comparative assessment of the impact of AI on task completion time across different interface types. This assessment aimed to evaluate the potential benefits and challenges of AI integration in each interface type, and to identify the areas where AI-driven solutions could have the most significant impact on task completion time and user experience.

Data Collection and Analysis

To support our findings, we collected data from the literature review and case studies, focusing on task completion time metrics and AI-driven improvements in interface design. This data was analyzed to identify trends, patterns, and correlations between AI integration and task completion time improvements across various interface types.

By employing these materials and methods, we were able to systematically explore the potential of AI in optimizing interface design and its impact on task completion time across different interface types. This approach allowed us to draw informed conclusions and provide valuable insights into the future of AI-driven interface design.

3. RESULTS

How do different types of interfaces affect task completion time?

The different types of interfaces can affect task completion time. Hu and Ning (2016) found that smaller icon size and icon color can negatively affect task completion time. Tessier, Ura and Miyata (2016) found that tangible interface geometry can affect task completion time. Zhou *et al.* (2022) found that shorter task completion time, more equal distribution of line of sight, visual focus closer to the login button, and average EEG amplitude changes can all positively affect task performance in older adults. Mazmela, Lasa and Agirre (2019) found that a poor TTF value can lead to high task execution times and error rates. Therefore, interface design can affect task completion time, and designers should be aware of these effects when designing interfaces.

How does the type of user interface affect task completion time for different types of tasks?

The type of user interface affects task completion time for different types of tasks. Song, Liu and Liu (2018) found that task type and users' cognitive style had significant effects on users' searching, reading, writing process. Mazmela, Lasa and Agirre (2019) found that the digital solution analysed does not offer the necessary fit to obtain satisfactory results in terms of individual performance. Liu, Song and Hansen (2021) found that users generally experienced three sub-

processes during task completion process: exploration, accumulation and composition/reporting. Thielsch, Haines and Flacke (2019) found that interface aesthetics had no significant effect on user performance in terms of accuracy and response time. However, from a practical perspective aesthetics still should be considered due to its positive effects on subjective perceptions of users.

How does the type of user interface affect task completion time for different types of users?

The type of user interface affects task completion time for different types of users. Song, Liu and Liu (2018) found that task type and users' cognitive style had significant effects on users' searching, reading, writing process. Gajos and Chauncey (2017) found that higher need for cognition is correlated with increased utilization rates, while higher extraversion is negatively correlated with utilization rates.

How does the type of user interface affect task completion time in different contexts?

Thielsch, Haines and Flacke (2019) found that interface aesthetics had no significant effect on user performance in search, creative, and transfer tasks. However, Chen and Chen (2020) found that participants using the smaller overview interface performed significantly better than those using the larger overview interface in the most difficult task.

Case studies: How AI has been utilized in interface designs to improve task completion time and user experience

We present four case studies that demonstrate how AI has been utilized in various interface designs to improve task completion time and user experience:

Graphical User Interfaces (GUIs) - Adobe Sensei

Adobe Sensei is an AI-powered feature integrated into Adobe Creative Cloud applications, such as Photoshop and Illustrator. By using machine learning and deep learning algorithms, Adobe Sensei enhances the GUI of these applications, making it easier for users to find the right tools, optimize their workflows, and quickly complete tasks. The AI-driven features, such as content-aware fill and automatic image selection, significantly improve task completion time for users.

Voice User Interfaces (VUIs) - Amazon Alexa

Amazon's Alexa is a voice-activated AI assistant that enables users to interact with various devices and services using natural language commands. Alexa's VUI is designed to understand and process voice commands accurately and efficiently, allowing users to complete tasks quickly and effortlessly. The continuous improvement of Alexa's natural language understanding capabilities through AI and machine learning helps reduce the task completion time for users.

Gesture-based Interfaces - Google's Project Soli

Project Soli, developed by Google ATAP (Advanced Technology and Projects), is a gesture-based interface technology that uses radar sensors to capture and interpret human hand gestures. The system leverages AI and machine learning

algorithms to recognize and process gestures accurately, providing a seamless and intuitive way for users to interact with devices. The integration of AI allows for continuous improvement of gesture recognition, potentially leading to faster task completion times.

Mixed Reality Interfaces - Microsoft HoloLens

Microsoft's HoloLens is a mixed reality device that combines augmented reality and virtual reality, enabling users to interact with digital content in a three-dimensional space. The device uses AI to understand the user's environment and gestures, providing a more intuitive and efficient way to complete tasks. The AI-driven spatial mapping and object recognition capabilities of HoloLens allow for seamless interaction with digital content, reducing task completion time and improving user experience.

These case studies demonstrate the potential benefits of integrating AI into various interface designs to enhance user experience and improve task completion time. As AI continues to evolve, we can expect further advancements in interface design and more efficient task execution across different interface types.

The results of our research, which combined a comprehensive literature review, case study analysis, and comparative assessment, revealed several key findings regarding the potential of AI in optimizing interface design and its impact on task completion time across different interface types.

AI-driven improvements in GUIs

Our analysis showed that AI technologies, such as machine learning and natural language processing, have contributed to significant improvements in GUI design. By enabling more personalized and context-aware interfaces, AI-driven GUIs demonstrated reduced task completion time and enhanced user satisfaction. Examples include intelligent content recommendations, adaptive layouts, and personalized interface elements that cater to individual user preferences and behavior.

Enhanced efficiency in CLIs

The integration of AI in CLIs has led to the development of intelligent command interpreters and predictive text suggestions, resulting in improved task completion time. These advancements have streamlined the user experience by reducing input errors and facilitating faster command execution, particularly for expert users who are well-versed in CLI usage.

Improved performance in VUIs

The application of AI in VUIs, particularly in speech recognition and natural language understanding, has substantially improved their performance and usability. These advancements have enabled more accurate voice input recognition, reducing the number of errors and contributing to faster task completion time. Additionally, AI-driven context-awareness in VUIs has facilitated more efficient user interactions by anticipating user needs and providing relevant information or suggestions.

Enhanced user experience in Gesture-based Interfaces

Our research indicated that AI-driven gesture recognition has significantly improved the accuracy and responsiveness of gesture-based interfaces. This improvement has led to more intuitive and seamless user interactions, resulting in reduced task completion time and a more enjoyable user experience.

Increased precision in Haptic Interfaces

The integration of AI in haptic interfaces has enabled more accurate force feedback and tactile sensations, allowing users to interact with digital systems more precisely and efficiently. This increased precision has contributed to improved task completion time, particularly in applications that require fine motor skills or detailed manipulation.

Immersive experiences in Mixed Reality Interfaces

Our findings revealed that AI has played a pivotal role in enhancing the realism and interactivity of mixed reality interfaces, including both augmented reality and virtual reality systems. AI-driven improvements in object recognition, spatial mapping, and real-time rendering have contributed to more immersive experiences and faster task completion times in various applications, ranging from gaming and entertainment to professional training and simulation.

Overall, our results demonstrated that the integration of AI technologies has significantly impacted task completion time across various interface types. By enabling more efficient, personalized, and context-aware interactions, AI-driven interface design has the potential to revolutionize the way users interact with digital systems and enhance overall user experience.

4. CONCLUSIONS

Our research investigated the potential of AI in optimizing interface design and its impact on task completion time across different interface types, including Graphical User Interfaces (GUIs), Command Line Interfaces (CLIs), Voice User Interfaces (VUIs), Gesture-based Interfaces, Haptic Interfaces, and Mixed Reality Interfaces (Augmented Reality and Virtual Reality). Through a combination of literature review, case study analysis, and comparative assessment, we identified several key findings regarding the role of AI in interface design.

Overall, our results indicated that the integration of AI technologies has significantly impacted task completion time across various interface types. AI-driven interface design has enabled more efficient, personalized, and context-aware interactions, resulting in reduced task completion time and improved user experience. These improvements have been particularly pronounced in GUIs, VUIs, Gesture-based Interfaces, Haptic Interfaces, and Mixed Reality Interfaces.

Our analysis revealed that AI-driven improvements in GUI design have enabled more personalized and context-aware interfaces, resulting in reduced task completion time and enhanced user satisfaction. Similarly, AI integration in VUIs has led to more accurate voice input recognition, facilitating faster task completion

time and improved performance. In gesture-based interfaces, AI-driven gesture recognition has significantly improved accuracy and responsiveness, leading to more intuitive and seamless user interactions. Additionally, the integration of AI in haptic interfaces has enabled more accurate force feedback and tactile sensations, contributing to more precise and efficient interactions.

Our research also highlighted some challenges in the integration of AI in interface design, such as privacy concerns, the potential for bias, and the need for ethical considerations in AI-driven decision-making. Addressing these challenges will be crucial in realizing the full potential of AI in interface design.

In conclusion, our research provides valuable insights into the potential of AI in optimizing interface design to enhance task completion time and improve overall system usability. By leveraging AI technologies, interface designers can create more efficient, intuitive, and context-aware systems that cater to the unique needs and preferences of individual users. As AI continues to evolve, its impact on interface design is likely to grow, leading to new opportunities for innovation and optimization in the digital realm.

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FISCAL RISK ANALYSIS – REASON FOR DANGER OR OPPORTUNITY FOR SAFEGUARDING?

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Abstract

This paper aims to provide an x-ray of the fiscal legislation regarding fiscal risk and the risk analysis that becomes the main (only) criterion for the development of the fiscal inspection program carried out by the fiscal bodies of the state. Thus, the work includes an analysis of concepts such as: taxpayer's fiscal behavior, fiscal risk, risk criteria, risk classes and subclasses, all intended to provide tools for carrying out a risk analysis based on special procedures.

The fiscal legislation adopted up to this moment allows us to understand the goal pursued by the national legislator starting from the recent regulations adopted at the European level. It is about the efficiency of tax debt collection activities, about the efficiency of the exchange of information in fiscal matters between the fiscal authorities of the member states, as well as about the profound and essential change in the fiscal behavior of taxpayers.

At the same time, this analysis highlights the shortcomings of this new taxpayer evaluation system, its transparency, as well as the means and instruments of defense in the face of pressures that may be exerted by the fiscal body, or even in the face of possible abuses that could directly and majorly affect some taxpayers.

Therefore, this paper presents all the relevant information in this matter, but also includes a critical analysis of the national regulations that were recently adopted in the context of the European regulations of recent years. These are intended to limit or even eliminate the erosion of tax bases in the effort to combat tax evasion or even tax fraud, that which affects national public budgets, but also that which directly or indirectly affect the budget of the European Union.

Keywords: *fiscal behavior; fiscal risk; evaluation criteria; risk classes; risk analysis; fiscal inspection.*

JEL Classification: K34, H26.

1. INTRODUCTION

It is an axiomatic reality that the fiscal system of each state provides it with the largest part of its financial resources and, therefore, independence and development. At the same time, certain types of behaviors have become increasingly evident, as a result of investors' desire to potentiate their profits.

Thus, amid changing the types and complexity of financial transactions, corroborated with the application of aggressive tax optimization schemes, fiscal regulations were seen a few steps behind the reality of the market. It was possible to notice frequent operations of transfer of profits from the jurisdictions where they would normally be taxed, to more favorable areas from a fiscal point of view in the context of an apparent compliance with legal provisions.

In the current context in which multinational companies generate a significant part of the world's gross product, cross-border transactions have dramatically diversified and evolved in volume and complexity. Operations with specific national characteristics have been gradually replaced by a global model, based on certain management schemes and integrated supply and development chains that centralize certain functions globally. The intangible component of benefits and the growing share of digital services delivered through virtual environments have significantly changed the structure of national and global economies, allowing the location of production or supply centers to be at a great distance from the beneficiaries, obviously in order to maximize their profits.

The governments noted the fierce concern of companies in minimizing their tax burden, but not through brutal non-compliance or ignorance of legal provisions, but through abuse of interpretation, by dissimulating the substance and transforming the architecture of transactions compared to the facts reality. Tax advantages were thus obtained by “optimization”, which allowed companies to display an apparent image of a good taxpayer. The process took place over several decades and manifested itself globally, and its initiators and creators raised to the rank of art the ability not to violate the letter, but only the spirit of the law. This is how the only one who was defeated in this process was ethics, but who still cares about morality when the stake is exponential growth is real profits? The answer should, of course, be the states to which significant amounts of money would have been due on the basis of the principle of fiscal sovereignty.

In this climate of the current globalization, the OECD started in 2013 the project “Erosion of the Imposition Base and Profit Transfer” (OECD, 2013) aiming to analyze the phenomenon leading to a double non-taxation, or to much lower taxation of cross-border transactions. In 2015, “Action Plan ” was issued containing 15 actions to counter that aggressive tax planning committed in order to escape by avoiding the payment of direct taxes (OECD, 2016).

BEPS aims, at the international level, to eliminate errors and to cover gaps in national tax legislation. The G20 Group of States supported this project, and the first implementing measures started in 2016 for the states involved in the project, OECD members and more. In this regard, on 24 November 2016, the Multilateral Convention for the Implementation in Tax Treaties of Measures to Prevent the Erosion of the Tax Base and the Transfer of Profits (OECD, 2016) was adopted at OECD level and by Romania in Paris on June 7, 2017 and ratified by adopting Law no. 5 of January 4, 2022 (Law no. 5/2022).

At the level of the European Union, the European Commission's constant efforts to combat tax evasion and tax fraud can be seen, not just on European funds, but also on national funds, especially as a percentage of VAT revenues are made to the EU budget, along with import duty revenues. This makes successive European regulations join the OECD's effort to limit the harmful effects of non-compliant tax practices.

DAC is an acronym for a series of seven European directives on administrative cooperation in the field of taxation (Administrative Cooperation), which reflects the authorities need for access to as much information as possible on taxpayers' business activities. Through these directives, the tax authorities of the Member States have agreed to cooperate with each other in order to correctly calculate the tax burdens they owe and to combat tax fraud and evasion.

Since the first directive from the series (EU Council, 2011), which introduced the automatic exchange of information of interest for the tax authorities, has been published, fiscal transparency standards have expanded more and more.

The following directives include financial information in the reporting standard, then the individual advance tax solution and the price agreement in advance, after which country-by-country reporting, and next directives includes standards for authorities' access to information so as to avoid money laundering. Based on these directives, tax information on taxpayers in a given country can move freely between EU tax authorities.

DAC 6 (EU Council, 2018) establishes the obligation to report cross-border modalities with fiscal risk, this information can obviously be exchanged between authorities. This directive requires special attention to the importance of the measures it establishes. Thus, it was established that *not only taxpayers but also certain third parties (intermediaries) should report to the tax authorities information on tax risks in cross-border transactions*. This directive aligns the EU's objectives with the OECD's objectives and covers the rules for disclosing aggressive tax planning strategies. Even if the objectives are common, *DAC 6 (EU Council, 2018) seems to go beyond the aspirations of the OECD by establishing better-defined rules to be transposed by Member States into national law in the very near future*.

DAC 7 (EU Council, 2021) is Directive no. 2021/514 amending Directive 2011/16/The EU on administrative cooperation in the field of taxation, focuses its attention on revenues generated through digital platforms and on tax evasion that can be committed by hiding these tax bases. In Romania, DAC 7 was implemented one month late compared to the deadline, DAC 7 rules being included in the Fiscal Procedure Code at the beginning of 2023 (Law no. 207/2015).

It is supposed that 2023 will also mark the first European regulations on the taxation of revenues resulting from transactions with crypto coins, as DAC 8 will be a pioneer in this complex, difficult and very damaging matter for the public budgets of all the states of the world.

2. CONCEPTUAL CLARIFICATIONS

We believe that in a democratic state where public authorities act correctly, efficiently, predictably and above all transparently, the planning of the specific activities of the state tax body (ANAF) and in particular of the tax inspection body must be based on objective criteria and must be carried out in conditions of transparency and equidistance towards all taxpayers.

In this context, since the beginning of 2019, the National Strategy and Forecast Commission (CNSP) and National Agency for Fiscal Administration (ANAF) have initiated a collaboration to identify taxpayers with high tax risk, in order to streamline checks and reduce tax evasion. This collaboration directly resulted in the establishment of a risk analysis direction within ANAF. The analysis performed at the level of this structure are of a statistical nature and refer to the fiscal behavior of the taxpayers viewed from this perspective. These analyses are made available to the state fiscal body, so that it can plan its fiscal inspection activity and direct it to those taxpayers who present a high fiscal risk.

Therefore, from the perspective of national tax authorities, every small or large taxpayer, companies or individuals is included on a scale of risk, depending on the tax behavior regarding the declaration and payment of taxes and duties, their amount, irregularities identified in previous controls and other circumstances that raise suspicions about voluntary tax compliance. For example, the ANAF Activity Report for the first half of 2021 (ANAF, 2021) states that „The major risks identified in the first half of 2021 are the risk of under-declaration of tax obligations, as well as the risk of non-payment of payment obligations, respectively: the risk of non-payment of tax obligations, the risk of late payment of tax obligations, the risk of causing insolvency or the intentional reduction of financial capacity”.

Because the legislation adopted at EU level uses concepts such as “erosion of tax bases”, especially in connection with direct taxation and in particular in connection with the taxation of profits of both the smallest and especially of multinationals with many elements of extraneity, we will also find such notions in the content of national regulations.

Another concept very often used, in this context, is that of the “taxpayers' fiscal behavior”, which may prove to be appropriate, and hence another concept, namely that of “tax compliance”, or the tax behavior may be inappropriate. In this situation, an opening to two hypotheses is created, namely: on the one hand, it can be a harmful fiscal behavior for public budgets, located at the lower limit of legality, but without prejudice to legal rules. The second hypothesis refers, however, to fraudulent tax behavior, a circumstance in which it is a question of flagrant violations of the tax law, with harmful consequences for public budgets.

It has to be mentioned that the amount of damage caused is less relevant in the analysis of these concepts, all the more so as it is sometimes difficult to assess. The emphasis lays rather on the moral conduct of taxpayers and on the idea of

respect of the principle of fiscal equity. In practice, it has proven that even a tax behavior at the limit of legality can also be extremely harmful to public budgets, which has forced states to react vigorously, both at EU level, as well as at a wider, global level.

Therefore, “inadequate tax behavior of taxpayers” can have many forms of manifestation, starting from hiding or diluting the tax mass, going on with the capitalization of more convenient tax legislation, or with evasion of payment by hiding the patrimonial assets from the forced execution and ending with the simple delay of the procedures for the administration of the fiscal receivables, without necessarily violating tax law.

The generally accepted premise refers to the impossibility of the national tax administration to fully verify the mass of declarations submitted by taxpayers, taking into account its staff and means. For this recital, the only criterion the legislator agrees with is that of the level of risk, which is established on the basis of the risk analysis.

The various forms of tax inspection discuss the organization and planning of the process of control files' selection. The competence to select the taxpayers to be verified belongs exclusively to the tax inspection body according to art. 121 Code of Fiscal Procedure (Law no. 207/2015), and the taxpayer does not have a right to appeal the selection procedure used and, therefore, it may not submit to any verification the way in which it was selected.

So here are many new concepts worth focusing on, for we are witnessing a resettlement of the paradigm in which the tax inspection and other instruments used to improve the risk of tax evasion will take place in the future.

Although the legislator does not define the notion of fiscal risk, from all the national regulations recently adopted by Romania, as well as from the analysis of the existing European regulations on this topic, we can draw the conclusion that the tax risk is directly related to the risk of tax evasion, which in turn is seen as the action / lack of action to avoid the effects of taxation on taxpayers' assets, without defeating the tax law, but only by speculating, harmful to public budgets, the inaccuracies between national tax laws, or within each of them.

On the other hand, art. 1 point 3 of the Code of Fiscal Procedure (Law no. 207/2015) defines the risk analysis as the activity carried out by the fiscal body in order to identify the risks of non-compliance with the fulfillment by the taxpayer of the obligations provided by the fiscal legislation, to evaluate them, to manage them, as well as to use them for the purpose of performing tax administration activities.

Based on the active role of the fiscal body provided in art. 7 of the Code of Fiscal Procedure, it has the right and obligation to examine objectively the tax situation, namely in the conditions and limits established by law. So, the fiscal bodies entitled to examine, ex-officio, the real situation, to obtain and to use all the information and documents needed to determine correctly the fiscal situation

of the taxpayer, and in the analysis the fiscal body is obliged to identify and to take into consideration all the clarifying circumstances, for each case.

Line (5) of the same art. 7 of Code of Fiscal Procedure establishes the fact that in the case of tax receivables administered by the state fiscal body, the administration procedures are performed according to the tax risk class and subclass in which taxpayers are included as a result of the risk analysis carried out by the tax body. This tax risk analysis is performed periodically to establish, or to review, the tax risk class and subclass of each taxpayer, which is published on its own website. Taxpayers cannot object to the determination of the tax risk and the class or subclass of risk in which they have been classified.

Furthermore, line (9) establishes the fact that the procedure to solve appeals is not done according to the class/subclass of risk.

So, through art. 7 line (6) of the Code of Fiscal Procedure, three main risk classes are consecrated, in which the taxpayers may be framed, namely the taxpayers with little fiscal risk, the taxpayers with average fiscal risk and the taxpayers with high fiscal risk.

From a procedural point of view, the selection of taxpayers subject to tax inspection is an exclusive attribute of the tax administration. The latter may receive information from other natural or legal persons regarding the regularity of the activity of a particular taxpayer, but the notification is made exclusively *ex officio*. The tax body has the right to withhold certain files for control, despite complaints from a third party

According to art.121/1 of the Code of Fiscal procedure, the taxpayers presumed to be the subject of a tax inspection are sent, by the tax inspection body, a compliance notification concerning the tax risks identified in order to re-analyze the tax situation and, if the case, to submit or to correct the tax declarations. The same notification notifies that, in 30 days since the date of the notification, they have the possibility to submit or to correct the tax declarations. Until this deadline expires, the tax inspection body does not take any action for the tax inspection selection. The submission or the correction of the tax declarations by the taxpayer does not prevent the selection for tax inspection but after the abovementioned deadline is over. After this deadline the taxpayers with high tax risk who have not corrected the tax risks they have been notified for, are mandatorily submitted to a tax inspection or to a documentary verification.

3. CLASSES AND SUBCLASSES OF TAX RISK

The general criteria according to which the fiscal risk class is established are established by par. (7) of art. 7 of Code of Fiscal Procedure. The development of the main risk classes in risk subclasses and the development of the general criteria in the sub-criteria, as well as the procedures for establishing the subclasses and sub-criteria were achieved by the Order of the President of ANAF no. 2,017 of

November 14, 2022 on the approval of risk sub-criteria developed from the general criteria.

Therefore, the tax risk sub-criteria called upon to develop the general tax risk criteria are the following:

- a) for the tax registration criterion:
 - 1. the sub-criterion concerning non-registration for VAT purposes;
 - 2. the sub-criterion regarding the non-registration as a profit tax payer;
 - 3. the sub-criterion regarding the non-registration as a specific tax payer;
 - 4. the sub-criterion regarding the non-registration as a taxpayer on the income of micro-enterprises;
 - 5. the sub-criterion regarding the non-registration as an excise payer;
 - 6. the sub-criterion regarding the non-registration as a taxpayer of income tax, as well as of compulsory social contributions;
 - 7. the sub-criterion regarding the non-tax registration in case of carrying out activities, obtaining income and other situations provided by law for which there is an obligation to register tax;
 - 8. the sub-criterion regarding the risks associated with shareholders / associates / administrators / other persons, from the perspective of the fiscal registration;
- b) for the criterion regarding the submission of tax returns:
 - 1. the sub-criterion regarding the late submission of tax returns;
 - 2. the sub-criterion regarding the non-submission of fiscal declarations;
 - 3. the sub-criterion regarding the erroneous submission of tax returns;
 - 4. the sub-criterion regarding the risks associated with shareholders/ associates/ administrators/ other persons, from the perspective of submitting the fiscal declarations;
- c) for the criterion regarding the level of declaration:
 - 1. the sub-criterion regarding the inconsistency of the data from the fiscal declarations compared to the data from other forms provided by law, submitted by the taxpayer;
 - 2. the sub-criterion regarding the discrepancy of the data from the fiscal declarations and other forms provided by law submitted by the taxpayer, compared to the data and information transmitted by third parties;
 - 3. the sub-criterion concerning the incorrect declaration of the quota and amount of taxes, duties and contributions by the taxpayer;
 - 4. sub-criterion regarding the profitability reduction;
 - 5. the sub-criterion regarding the risks associated with shareholders / associates / administrators / other persons, from the perspective of the level of declaration;
- d) for the criterion regarding the fulfillment of payment obligations to the general consolidated budget and to other creditors:
 - 1. the sub-criterion regarding the late payment of tax obligations;

2. the sub-criterion regarding the non-payment of fiscal obligations;
3. the sub-criterion regarding insolvency;
4. the sub-criterion on the risks associated with shareholders / associates / administrators / others, from the perspective of fulfilling the payment obligations.

So, as it is explained in art.2 of the ANAF President Order no.2017 from November 14, 2022, the development of the risk sub-criteria are done by reporting them to the risks of non-compliance regarding the fulfillment of the taxpayer of all obligations mentioned by the fiscal legislation, associated with the four general criteria. These risks of non-compliance are risks that concern the tax registration, the submission of tax declarations, the level of declaration and fulfillment of payment obligations to the consolidated general budget and to other creditors.

The risks concerning the tax registration aim at the aspects connected to the taxpayers' non-compliance, regardless the juridical aspect, from the perspective of the respect of tax obligations' registration

The risks concerning the tax declarations' submission aim at aspects in connection with the non-compliance of the taxpayers, from the perspective of the respect of obligations of submission, with full information and in due time, of the tax declarations.

The risks regarding the level of declaration aim at the aspects connected to the taxpayers' non-compliance, from the perspective of the correctness, coherence, concordance of the share and of the amount of the interests, taxes and the contributions declared in the fiscal declarations and in other forms provided by law, submitted by the taxpayers.

The risks concerning the fulfillment of the payment obligations to the consolidated general budget and to other creditors aim at the aspects connected to the taxpayers' non-compliance, from the perspective of the fulfillment of payment obligations to the consolidated general budget and to thirds, as well as the aspects connected to their solvency and creditworthiness.

4. OBSERVATIONS FROM PRACTICAL ACTIVITY

Because the grid of indicators applied by ANAF in the analysis of calculating the degree of fiscal risk of Romanian taxpayers has not been public for a long time, in terms of practice, certain patterns of tax behavior have been identified, some of which may be associated with transfer prices (by definition, transfer prices are the prices at which transactions take place between companies that are parties to the same group, also called related parties). From the practice of tax law can be extracted and highlighted certain situations that can attract the attention of the fiscal bodies as likely to hide non-compliant fiscal behaviors.

The recording of the accounting losses in recent years, especially in cases where related party transactions have an increased share of the company's turnover or of a taxpayer who is captive in the group he belongs to. Accounting losses can

attract the attention of tax authorities, because they can hide situations of non-compliant tax practices and therefore of fiscal risk.

On free market, some companies can give up the business partners who are the source of these losses and can completely get off the market. In order to understand the source of the continual losses of a related partner who, sometimes, has not the same freedom to chose his partners as an independent company has, the fiscal authorities can ask for the file with transfer prices. Although there are cases when these continual losses are from operational and commercial reasons, they should be documented in order to avoid possible adjustments of transfer prices in the transactions with related parties, respectively penalties.

The refund requests of VAT from the state budget may represent another opportunity of fiscal risk. Any taxpayer who has to recover VAT from the state budget is at risk regarding a possible fiscal inspection of transfer of prices. Even if the tendency, in the past few years, is of VAT refund, with notification for a further on fund fiscal inspection, the presence of the transfer prices file may determine the authorities to not ask for a later control.

Declaring profit margins below the average of margins reported by other companies having the same CAEN Code (Classification of Activities from the National Economy of Romania Code) is another circumstance that can attract the attention of tax authorities. Perhaps one of the main reasons why fiscal inspections are started is represented by obtaining lower profit margins compared to other companies with the same CAEN code corroborated with the existence of an affiliation relationship identified in the databases. In fact, in ANAF's risk department lists of affiliated companies and their financial indicators are extracted. These lists are filtered function of the code CAEN and then the average of profitability indicators is calculated. Based on these analysis, the companies recording a profitability less than the average profitability of the companies with the same CAEN code can be framed in an average or big class of risk and further on they may become the object of a fund fiscal inspection because the transfer prices file will also be checked.

The recording of voluntary intern adjustments of transfer prices in other accounting periods, whether we are talking about adjustments to initial purchase prices in related party transactions, or about the year-end adjustments of the profitability margins obtained by the local entity in terms of group policies, they are of increased interest for the tax authorities. Invoices with positive values paid to foreign entities, for any reason other than strictly commercial, generate an increased tax risk and they need to be supported by correct reasoning and supporting documentation in the transfer pricing file. Also, the taxpayers should take into consideration the way these invoices are recorded, because a recording in another year than the one for which the adjustments for transfer prices are done is a behaviour that may, indirectly, lead to a fiscal inspection because it has the potential to generate variations in the reported financial results.

Discrepancies between the taxpayers' declared VAT obligations and the ones of their partners may raise the attention of the fiscal authorities. In the case the taxpayers have activities with affiliated entities, the value of the acquisitions and deliveries should be declared balanced by all the parts involved. Talking about a source of information directly accessible, the discrepancies that appear in case an omission occurs in the declaration between parts can be rapidly identified by the fiscal authorities.

Carrying out restructuring of the nature of mergers, divisions, dissolutions, business transfers, insolvencies can represent as many situations of fiscal risk. This kind of operations concerning the legal status of the companies leads to significant variations in the financial - accounting results they submit and such variations will be checked by the fiscal authorities. More than that, the submission of the insolvency declaration can lead to non-collection of interests and taxes by ANAF, reason for which the insolvency procedure start is often preceded by a fund fiscal inspection that checks also the file of transfer prices. And more than that, in the situation of a business or constituent assets transfer, beside the optional documentation concerning the modifications at functional level, the taxpayers must provide the fiscal authorities with an evaluation report that justifies the amount at which they were traded.

When the place of profits report is different from the one the economic activities take place, according to the CbCR reports, the national fiscal authorities should check the reason of this discrepancy that could hide an unconformed fiscal situation. The Organisation for Cooperation and Economic Development (OCDE) published statistics from the CbCR reports, the main conclusion being the existence of discrepancies between the jurisdiction where the profits are reported and the jurisdiction where the economic activities take place.

Non - submission or delay of submission of fiscal declaration or delayed payment of interests and taxes represent as many circumstances that could catch the attention of the fiscal authorities. Following the tax collection is one of the important functions of ANAF's structures. Obviously, for a most efficient collection, the fiscal authorities also have at hand the instrument represented by the fiscal inspections that can be immediately used in situations of delay of fiscal declarations submission or, worse than that, when the taxes are not payed in due time.

The recording of the administrative services with significant value represent another situation that may raise questions for the authorities. So, in the situation when, on the list of transactions with affiliated parts, there are administrative services received from an external entity, namely management, IT or accountancy, these ones can represent an increase in risk, especially if these services are justified by the taxpayer only through invoices with a limited description, that have significant values compared to the turnover of the Romanian entity or even lead to losses at local level. The taxpayers should be sure that the administrative

services received in the group bring real benefits in the local business processes and that they are able to present the fiscal authorities justifying analysis and documents to prove that the services the services received are factually provided at an appropriate price.

The discrepancy between the sums reported in the financial situations and the fiscal declarations may raise the attention of the fiscal organs that have the obligation to check. Thus, the incomes and expenses reported in the fiscal declaration and the ones reported in the company's accountancy balance could be different in certain situations, what can be the object of a fiscal inspection.

Last but not least, since September 2020, the existence of transactions with affiliated persons is a situation that should be distinctly noticed to the fiscal authorities because, if corroborated with certain financial factors, may raise the fiscal organs' suspicion.

5. CONCLUSIONS

A careful analysis of the regulations on tax risk analysis seen as a tool to combat the erosion of tax bases, as well as an equidistant and focused analysis of the general criteria and sub-criteria corresponding to each, reveals a series of conclusions.

Thus, through these criteria for tax risk assessment are taken into account the most important groups of legal obligations incumbent on taxpayers in the process of collecting tax claims, namely: the obligation to register as a taxpayer, the obligation to declare correctly and at the legal terms of the taxable mass and the obligation to pay the tax receivables. From this perspective, we have to make some remarks regarding the observance of the obligations to declare the taxable mass, because it is often the subject of extensive disputes, important and long-term among some less docile taxpayers in relation to the tax body. Who can tell if, for the past, the fiscal declarations submitted by the taxpayers have been correct or not? We ask this question being aware that some taxpayers chose to align the requests of the fiscal organ, even if they considered them wrong, just not "to bother" and to draw its attention. Others chose to lead real "battles" with the fiscal representative, that they may have won or will win, but up to then they present "a high fiscal risk" from the point of view of the criteria submitted to this analysis.

The Order of the President of ANAF no. 2,017 of November 14, 2022 regulates the sub-criteria for assessing the fiscal risk, but not the working procedures necessary for the fiscal body. We believe that, for the time being, the applicable tax legislation in this area does not create a transparent framework for work, as any taxpayer would like, all the more so as the result of the tax risk analysis is excluded by the legislator from the possibility of challenging him on the path of administrative-fiscal litigation. Arguments could be identified to justify the choice of the legislator to not allow contesting the fiscal risk analysis although we consider such a choice at least weird.

For each of the above-mentioned sub-criteria there should be further explanations on how to quantify them, for some of them seem clearer and easier to quantify, while others do not, or we believe that every taxpayer should be able to make a relative assessment on his own. This would only be possible with simple and clear criteria, based on relevant information that should be able to be collected from ANAF databases, while respecting, of course, of the legal provisions regarding the protection of personal data.

Last but not least, the legislator treats all these criteria as situations of non-compliance of the taxpayer, but a closer analysis suggests that these criteria may reveal circumstances other than non-compliance with the convertible. Also, some of the circumstances considered at the time of elaborating these criteria may highlight a constant non-compliant behavior of the taxpayer, a circumstance in which his fraudulent intention is implied, but others may hide simple negligence, which has nothing in common with constant behavior of a certain nature. Obviously, the legislator “educates” on this occasion the future behavior of taxpayers, but for the past there was no such “stake”, which, in the very near future, will create completely unjustified shortcomings for taxpayers.

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TOWARDS THE IMPLEMENTATION OF ROBOTIC PROCESS AUTOMATION IN THE PUBLIC SECTOR OF EUROPEAN COUNTRIES: BENEFITS, CHALLENGES, AND BEST PRACTICES

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Abstract

Robotic Process Automation (RPA) is a rising technology with immense potential in bringing significant benefits to the public sector, worldwide. Although RPA implementations in the public sector are still in early stages, several European countries have already made significant progress in this domain. The manuscript aims to explore the benefits and challenges associated with RPA implementations, such as improving efficiency and reducing costs while ensuring that job loss avoidance. Further, the manuscript outlines future paths regarding the implementation of RPA in the public sector, with an emphasis on the European countries.

Keywords *Robotic Process Automation; Public Process Automatization; IT for public sector; RPA case studies.*

JEL Classification: G19, M15, H75.

1. INTRODUCTION

In the last years, the technology rapid advancements have brought transformative changes worldwide and in various industries, including the public sector. Besides Artificial intelligence, Internet of Things and Blockchain, RPA is among the latest technological innovation that have gained significant attention worldwide. RPA involves the use of software robots for the purpose of automate the repetitive tasks, enhancing the processes efficiency and accuracy in different organizations (Anagnoste, 2017; Anagnoste, 2018; Bakarich and O'Brien, 2021). RPA has the potential to revolutionize certain operations, to minimize costs, and to optimize the allocation of resources. Due to these, the RPA captured the interest of researchers and practitioners. According with the literature (Juell-Skielse, Güner and Han, 2022) the European countries have recognized the potential of RPA and have been implementing it in various government agencies and for encompassing certain tasks in administration, decision-making (Bernhard and Wihlborg, 2022), and citizen services (Juell-Skielse, Güner and Han, 2022). This article investigates the implementing projects that include RPA in the European public sector and aims to emphasize on its benefits and challenges.

Despite the fact that the implementation of RPA in the European countries' public sector is still in early stages, some non-EU countries have already made significant progress towards the adoption of this technology. The United Kingdom is considered one of the pioneers in RPA implementation in the public sector, as several government agencies are using RPA to automating repetitive administrative tasks such as data entry, paperwork management and process, and emails coordination. The Swedish Tax Agency has also implemented RPA for automating the tax processing (Cooper *et al.*, 2019), which has resulted in significant cost reduction and efficiency improvements.

In the light of the above (Juell-Skielse, Güner and Han, 2022) bridge that gap by presenting findings from a comprehensive survey on RPA adoption across Sweden's public sector. The results display a heightened awareness of RPA's potential in the Swedish public sector, although its actual implementation remains relatively moderate. Moreover, the authors highlight that variations in adoption rates emerge when comparing central and local government entities. The perspectives collected through the above-mentioned studies stand to be a valuable benchmark for other nations and public administration models seeking to navigate similar terrains.

Overall, the literature review shows that the benefits of implementing RPA in the public sector are significant. As mentioned above, one of the most important benefits is the ability to automate routine administrative tasks, which offers more time to public sector employees' and allow them to focus on more complex tasks. Further, RPA implementation can help minimize errors and improve processes accuracy, and these two benefits can lead to an improvement of public services quality. Moreover, RPA can help European public sector from different countries to comply with the enforced regulations and to reduce the risk of non-compliance (Anagnoste, 2018).

2. RESEARCH METHODOLOGY

To address the research questions and investigate the implementation of RPA in the public sector of European countries, a literature review approach was used. The current study provide answers to the following three research questions (RQ):

RQ1 - What benefits are obtained by the European public sector countries when implementing RPA technology?

RQ2 - What challenges face the adoption of RPA in automatizing the public services?

RQ3 - What relevant European case studies can be identified in the specialized literature regarding successful RPA implementation?

An initial search among paper published was conducted on the Web of Science (WOS) database, resulting in the identification of 39 relevant articles published between 2017 and present (2023). The keywords used are displayed in Figure 1.



Figure 1. Keywords search and WOS results

Source: Web of Science (2023)

Further, inclusion and exclusion criteria were employed, based on the relevance and content alignment, 27 papers were retained for in depth analysis. 12 papers were removed from the analysis as the topic was not in line with the objectives of the current analysis. The final selection of articles encompasses a wide range of perspectives on RPA adoption in European countries but also include some non-European endeavours for the purpose of performing comparisons. The final list of 27 papers were critically analysed. The manuscripts were read, and pertinent information related to the challenges, opportunities, and implications of RPA implementation in the EU public sector were extracted. The results were organized into three sections, facilitating the identification of patterns, insights, and future paths across the reviewed literature.

This review methodology was conducive to a comprehensive exploration of RPA's implementation projects within the public sector in Europe and offers important insights into the actual state of RPA adoption. Further, there are signalized the challenges faced, the benefits obtained, and the potential implications on public services and the dynamics of workforce. The various perspectives extracted from the pool of 27 articles, contributes to a comprehensive understanding of the aspects regarding the RPA implementation in the European public industry.

3. RESULTS AND DISSCUSSIONS

In order to answer the research questions presented in the methodology section, the following sub-sections extract the findings from the reviewed literature.

3.1. Benefits of implementing RPA in the Public Sector (RQ1)

Accordingly, RPA offers important promise for improving the operational efficiency and effectiveness within the public sector of European countries. The publications of analysed authors highlight the benefits that RPA offers in the context of governmental processes . Hyun *et al.* (2021) prove that RPA can streamline the labour-intensive tasks and eliminate the likelihood of errors. Such benefit is crucial for the public sector, where administrative processes often involve repetitive (Sasak, 2020b) and rule-based activities. The results also

suggests that through the automatization of these routine tasks (Juell-Skielse, Güner and Han, 2022), government employees can be liberated and they can focus on complex, strategic and value-added activities.

The potential for cost reduction (Lindgren *et al.*, 2022) is a highly important advantage of RPA adoption. Several authors affirm that the implementation of RPA can lead to substantial cost savings (Likhacheva, Setchenkova, and Slepneva, 2020) as it reduces the need for extensive manual labor. Consequently, this action can lead to optimized resource allocation within public administration, freeing up time and financial resources that can be directed to other critical actions.

In the financial area related to the public administration, (Likhacheva, Setchenkova, and Slepneva, 2020) highlight the importance of RPA, along with other digital technologies, in the transformation of financial operations. Due to the integration of Artificial Intelligence, Big data, and Machine learning techniques, financial services can access relevant information resources. By this integration, it is facilitated the planning and analysis infrastructure consolidation, contributing to improving the decision making process (Bernhard and Wihlborg, 2022) and organizational efficiency (Prokofyeva and Zaytsev, 2020).

Furthermore, RPA projects can improve transparency (Ranerup and Henriksen, 2019; Johansson, Thomsen, and Akesson, 2023) and accuracy in public services. Stojakovic-Celustka (2020) emphasizes that RPA can be particularly beneficial in areas such as insurance and banking services, trading and capital markets, and risk management. Throughout the automatization of complex processes, RPA lead to reducing the chances of manual entry errors and provides a consistent compliance to regulations and policies (Ranerup and Henriksen, 2022) and this is crucial for the public sector, where maintaining data consistency, accuracy and compliance is a paramount.

RPA's potential to expedite administrative processes is also evident in the case study by Zhang, Thomas, and Vasarhelyi (2022). Their work introduces the concept of Attended Process Automation (APA), which signals that RPA enables auditors to work alongside and interact with automation routines. By such collaborative approach the audit workflows accelerates and also leverages the capabilities of RPA to improve auditors' professional judgment in tasks that cannot be fully automated. This study demonstrates a combination between human expertise and automation which enhances the effectiveness of public auditing.

The collective research stresses the transformative potential of RPA in the public sector of European countries. Among the benefits brought by RPA, we found the ability to streamline operations, costs minimization, accuracy improvements, and enhance the role of human professionals presents a compelling case for its adoption. It is known that European governments are in the quest to

optimize public services, and thus RPA emerges as a key technology that unlocks the operational efficiency and leads to better service delivery.

3.2. The challenges of RPA implementation (RQ2)

The literature analysis revealed several challenges that public institutions have to face when implementing RPA projects.

Technical complexity and integration challenges

RPA implementation within the public sector bears multiple technical challenges. Zhang and Vasarhelyi (2022) highlight the need for organizations to have robust IT infrastructure (Flechsigg, Anslinger and Lasch, 2022) and integration capabilities to ensure seamless interactions between RPA systems and existing software. Mihai, Aleca and Gheorghe (2023) mention the complexity of integrating emerging technologies like Artificial intelligence and the Internet of Things with RPA, which requires additional and substantial technical expertise.

Employee resistance to change and workforce concerns

Some authors (Lindgren *et al.*, 2022) identify numerous challenges that arise from people's resistance to change and the workforce concerns (Parchande *et al.*, 2019). Employees might fear that RPA implementation could lead to job displacement (Sarilo-Kankaanranta and Frank, 2021), resulting in reluctance to accept the new automation of public processes. Moreover, (Lindgren *et al.*, 2022) emphasize on the the importance of involving employees in the RPA implementation process and properly address their concerns to ensure successful adoption.

The complexity of public processes

The administrative processes are known for their variability and high complexity. Because of these, the public processes are a real challenge for RPA implementation. (Prokofyeva and Zaytsev, 2020) discuss these issues in the context of the public healthcare industry. As a measure to overcome these challenges, there can be employed different scenarios and exceptions which, in turn, requiring extensive analysis and customization of RPA workflows.

Data privacy and security

The sensitive nature of public sector data, which handles citizen private information, is perceived as a high challenge. Thus ensuring data privacy and security becomes paramount for RPA implementations (Bernhard and Wihlborg, 2022). Further, Staegemann *et al.* (2021) emphasize the need to maintain a high level of trust and security if implementing artificial intelligence based chatbots and RPA for managing crisis communication. The authors (Staegemann *et al.*, 2021) also highlight the importance of monitoring user behaviour and data analytics to gain insights while safeguarding privacy (Stojakovic-Celustka, 2020).

Resource allocation and constraints

The resource constraints perceived as a challenge in the RPA implementation for public sector are discussed by Sobczak and Ziora (2021). The authors mention

that the limited funds and resources might hinder the RPA adoption, which requires high initial investment in technology, employee training, and even process redesign.

Regulatory and compliance challenges

The public industry is constrained by strict regulations and compliance requirements (Anagnoste, 2018). Regulatory and compliance issues (William *et al.*, 2019) can block RPA projects, as highlighted by Parchande *et al.* (2019), who emphasize the importance of ensuring that public process automation are complying with the legal and regulatory frameworks.

Organizational change management

When RPA projects are implemented in an organization, it can lead to significant changes in workflows and roles. Zhang, Thomas and Vasarhelyi (2022) highlight that auditors' roles in an RPA-enabled audit workflow need to be redefined, requiring important organizational change management strategies to ensure a facile transitions and effective utilization of RPA (Hyun *et al.*, 2021).

As presented above, the challenges of RPA project implementations within the public sector include technical complexity, integration challenges, resistance to change, data privacy and security concerns, financial and resource constraints, regulatory and compliance issues, and the need for effective organizational change management. These challenges underscore the importance of careful planning, stakeholder engagement, and strategic alignment when adopting RPA in the public sector.

3.3. Case Studies of regarding RPA implementation in the public sector (RQ3)

In the endeavour to answer the third RQ, this section presents a compilation of case studies found in various countries within the European region, Poland, Sweden, Germany, Finland, etc.) and not only (United Kingdom, Russia, India). These case studies offer a comprehensive understanding of the multifaceted applications and implications of RPA projects across diverse public sectors, such as healthcare, public administration, public accounting, and more. These real-world examples together with the presented benefits and challenges, highlight the real potential of RPA for the public sector of and offers valuable insights for future implementations of RPA projects.

Sobczak and Ziora (2021) present a case study regarding the implementation of RPA in Bydgoszcz City Hall, Poland, for electricity billing document management. The authors describe how RPA facilitates the automation of processes in a smart city context. This implementation resulted in fast and measurable improvement in document management processes, showcasing the potential of RPA in enhancing administrative efficiency.

Likhacheva, Setchenkova, and Slepneva (2020) illustrate a case study on the general use of cutting-edge technologies, which includes RPA, for the financial

departments of public Russian organizations. The authors prove that the implementation of RPA in financial departments led to improved efficiency, reduced costs, and improved the operational effectiveness. Moreover, it is proven that the integration of RPA with other digital technologies enabled these companies (financial departments) to build a unified infrastructure that better serves their interests.

Zhang, Thomas and Vasarhelyi (2022) introduce an Attended Process Automation (APA) framework for incorporating the RPA technology into the audit workflow. The authors apply in their study the APA framework for the planning process of a single audits for the particular situation of Swedish municipalities. The case study demonstrates that auditors can work together and interact with RPA routines to enhance the audit process. Moreover, the APA framework accelerates the important role of auditor in leveraging RPA for an improved decision-making process.

Other authors (Prokofyeva and Zaytsev, 2020) examine the RPA application in the public healthcare industry for the analysis of patient clinical pathways. Authors display in their case study the patient's routes related to sepsis diagnosis. By using different techniques, such as hierarchical agglomerative clustering and additive regularization of topic models, the study identifies patterns in patient trajectories. The case study proves the potential of RPA technology, in combination with others, to the optimization of patient flow and resource allocation in for public healthcare institutions.

Stojakovic-Celustka (2020) presents an overview of FinTech implementation, that includes RPA application for payment fraud prevention and detection using artificial intelligence techniques and data analytics. Additionally, this case study on Dubai Government's Blockchain Strategy showcases the implementation of blockchain technology and artificial intelligences, which are related to RPA technology in terms of technological advancements.

RPA is considered a solution for automating intricate business and operational processes (William *et al.*, 2019) characterized by high labour involvement and errors occurrence. The authors (William *et al.*, 2019) present a case study that reveals how RPA can enhance productivity in corporate services. Their study focuses on the RPA system that supports Corporate Service Providers in Singapore with annual compliance processes. The results show that the implementation improves significantly the CSP's productivity as it automatizes the compliance processes and ad-hoc client requests.

Zhang and Vasarhelyi (2022) present a very interesting case study on public education, which provides a detailed course design and materials for a 14-week RPA course tailored for the needs of accounting students. Although is not a traditional case study, its contribution provides valuable insights into how RPA public education can be structured and integrated into various university curricula.

Sasak (2020b) debates on the challenges of continued adoption of RPA in the Polish public sector and investigates two service centres that offers financial and HR consulting services. The case study underlines the importance of iterative decision-making while emphasizing on the need for sustained commitment to fully implement the potential benefits of RPA technology. Further, Sasak (2020a) discusses the concept of an intelligent generator of functionalities for IT&C system in public sector based on reference processes. This example establishes the potential RPA technology to optimize administrative services through process modeling and automation.

The case studies presented in this section highlight a wide range of RPA implementations in the public sector and not only, including financial departments, smart cities, healthcare, audit workflow, public services, corporate services, higher education, and public administration. These examples constitute best practices as they collectively point out the diverse applications of RPA in addressing various challenges and optimizing processes across different sectors within the public domain. Table 1 presents a synthesis of case studies in public (and private) sector of European countries while Table 2 presents the worldwide case studies identified in the analysed literature.

Table 1. RPA implementation case studies Europe

Sector	Country	Domain Analyzed	Case Study Topic	Reference
Public	Sweden	Municipalities, Audit Workflow	Challenges in RPA Implementation in Swedish Municipalities	Lindgren <i>et al.</i> (2022)
Public	European Union	Organizations, Digital Transformation	Influence of AI Technologies in EU Organizations	Mihai, Aleca and Gheorghe (2023)
Public	Poland	Smart City Implementation	RPA in Smart City Implementation: Electricity Billing Management	Sobczak and Ziora (2021)
Public	Germany	Crisis Communication, Public Information Provision	Use of Chatbots for Providing Information in Crisis Situations	Staegemann <i>et al.</i> (2021)
Public	Sweden	Audit Education	Teaching a 14-Week RPA Course for Accounting Students	Zhang and Vasarhelyi (2022)
Public	Poland	Healthcare	Clinical Pathways Analysis Based on Clustering Methods	Prokofyeva and Zaytsev (2020)

Sector	Country	Domain Analyzed	Case Study Topic	Reference
Public	Poland	IT System Generation	Generator of Functionalities Based on Reference Processes	Sasak (2020a)
Public	Poland	Public Services	Applying RPA in Administrative Processes of Public Administration	Raissa <i>et al.</i> (2019)
Public	Sweden	Social Services	Automated Decision-Making and Value Positions in Social Services	Ranerup and Henriksen (2019); Ranerup and Svensson; (2023)
Private	Poland	Business Processes	Software Robots in Business Process Automation	Sasak (2020b)

Source: projected by author

Table 2. RPA implementation case studies worldwide

Sector	Country	Domain Analyzed	Case Study Topic	Reference
Public	India	Contractual Employee Management	Contractual Employee Management System using Machine Learning and RPA	Parchande <i>et al.</i> (2019)
Public	Russia	Financial Services	Digital Technologies in Financial Departments of Companies	Likhacheva, Setchenkova and Slepneva (2020)
Public	Dubai, SAR	Various (Insurance, Banking, Trading, Risk Mgmt)	FinTech Implementation	Stojakovic-Celustka (2020)
Public/Private	Singapore	Corporate Services	Improving Corporate Secretary Productivity	William <i>et al.</i> (2019)

Source: projected by author

4. CONCLUSIONS

According with the reviewed literature, the list of additional public processes that can be automated with RPA technology, is presented below:

1. Document management and automation of data entry. By automating the manual process of data entry and document management the public sector can minimize errors and maximize employee's efficiency.

2. Employee on-boarding. The automation by RPA of employee on-boarding process, which includes email sending and receiving, creating user accounts, updating systems, can lead to time save and reduce the manual input.
3. Budget and financial reporting. When automating the process of budget and financial reporting can be obtained benefits such as accuracy, reduce the time required to complete reports, and allow public administrators to focus on more strategic tasks.
4. Procurement and purchasing. Automation within procurement and purchasing processes can modernize these processes, eliminate the manual input effort, and increase the accuracy of data.
5. Licensing and permit processing. RPA can automatize the licensing and permit processing process. Besides eliminating the input errors and efforts, RPA can improve the accuracy and speed of the process.

Regardless of the challenges of RPA implementations, its future use in the public sector of European countries sounds promising. Further, as more governments recognize the benefits of RPA, we will notice an advent in RPA adoption in government agencies and public sector. Additionally, as RPA technology will continue to progress, we can expect to discover even more advanced use cases. Thus, future investigations have to be pursued.

The implementation of RPA in the public sector in European countries has the potential to bring significant benefits, including improving efficiency, reducing costs, and enhancing citizen services. While there are challenges to implementing RPA in the public sector, careful planning and investment can help overcome these challenges.

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EXPLORING THE CHALLENGES AND OPPORTUNITIES OF IMPLEMENTING A GOVERNMENTAL CLOUD IN ROMANIA

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Abstract

Although it brings numerous opportunities for the government and its citizens, the implementation of a governmental cloud is a complex and tedious process that involves a wide range of technical, operational, and political challenges. The manuscript aims to explore some of the most significant challenges together with the measures to counteract them as well as the opportunities of implementing a governmental cloud. Further, the article compares the particularities of Romania with other European countries that went throughout the process of implementing similar projects on Governmental Cloud.

Keywords: *Governmental Cloud; Public Sector Digitalization; IT for public sector.*

JEL Classification: M15, G19, H75.

1. INTRODUCTION

The roots of Governmental Cloud (GC) can be traced back to the early days of cloud computing in the early 2000s, when private companies began to adopt cloud computing to improve efficiency and reduce costs. Governments soon recognized the potential of cloud computing to deliver better services to citizens, reduce costs, and improve operational efficiency, leading to the development of GC services (Ivanus and Iovan, 2014; Me, 2014). As the cloud serves as the foundation for the GC as it provides a secure and scalable platform for public sector operations, the beginning of GC is strictly connected with the emergence of cloud computing.

Therefore, in US, the Federal Risk and Authorization Management Program (FedRAMP) was established in 2011 (Warren and Sabetto, 2018) and aimed at providing a standardized approach to security assessment, and to monitoring cloud products and services provided to federal agencies. This action is among the pioneering actions and thus can be perceived as an essential step in promoting the

use of cloud technology in the US government operations (Me, 2014; Wang *et al.*, 2016).

Related to the emergence of cloud computing in Europe, the first adoptions commenced by 2012 when the European Commission adopted a strategy for "Unlocking the potential of cloud computing in Europe" (Ivanus and Iovan, 2014; Deloitte, 2021).

The current state of GC approaches varies across different countries and regions of the world. Some have fully implemented GC platforms by developing national GC platforms, while others are just beginning to explore the possibilities of cloud computing in the public sector. It is widely known that GC adoption has been driven by a range of factors, including the need for increased efficiency, the desire to improve services, and the urge to modernize aging IT infrastructure (David *et al.*, 2023) especially during crisis such as Covid-19.

2. BENEFITS AND LIMITS ASSOCIATED WITH THE IMPLEMENTATION OF GCS

Implementation of a GC brings numerous benefits for government, such as increased efficiency, viable access to public/government services, evolved data analytics, and increased innovation. However, there are also significant challenges associated with implementing a GC, including security, ethic issues and privacy concerns (Wang *et al.*, 2016), compliance with regulations, interoperability, and high cost (Me, 2014).

Among the challenges, warranting the security (Wang *et al.*, 2016) and privacy of sensitive government data (Joshi, Islam and Islam, 2017; Brandis *et al.*, 2019) are on top. As a result, Governments must protect confidential information, such as citizen data, financial (classified) information, from unauthorized access and eventual cyberattacks. Data breaches could have serious consequences, including damage to the government's reputation and potential legal liability. Thus, it is critical that the GC should be developed with a primary focus on security (Choi and Lee, 2015) and that appropriate measures are implemented to protect the data. Moreover, some authors (Joshi, 2017) recommend that the challenges of security and privacy should be addressed before adopting GC.

Further, the challenge associated with implementing a GC can be related to existing regulations (Me, 2014) such as GDPR for example (Joshi, Islam and Islam, 2017). It is known that Governments implemented a range of regulations that must be followed when developing a cloud solution and it includes data protection and privacy regulations. Governments must ensure that the cloud provider selection is compliant with the existing regulations, and that they have adequate precautions in place to prevent eventual data breaches. Besides, (Joshi, Islam and Islam, 2017) declares Governments should develop their own regulations for cloud computing.

Interoperability is also a significant challenge when it comes to implementing a GC (Joshi, 2017). Different government agencies often use different systems and data formats, which can create difficulties when trying to integrate these systems into a unified cloud-based solution. Ensuring that the GC is interoperable with existing systems and data formats is crucial to ensure that different government agencies can work together effectively. Some manners to achieve interoperability can be: using open standards (Joshi, Islam and Islam, 2017), creating a central repository of government data (Brandis *et al.*, 2019), developing a cloud interoperability framework (Brandis *et al.*, 2019).

Cost is a significant challenge when it comes to implementing a GC and some (David *et al.*, 2023) consider it a barrier. Although implementing a GC can be expensive (requires important investments in hardware, software, and personnel) ways to minimize the costs can be obtained, such as (David *et al.*, 2023) sharing resources with other government agencies, using open-source software, and choosing a cloud computing provider that offers a pay-as-you-go pricing model. Nevertheless, Governments must ensure that they have the budget to support the costs and that they are able to justify it to citizens and stakeholders.

Despite the challenges associated with implementing a GC, there are also numerous opportunities provided by GC. One of them is increased efficiency (David *et al.*, 2023) and it is perceived as a long-term benefit. Thus, by implementing a GC, agencies can increase their operational efficiency, streamline their processes, and reduce the costs associated with managing and storing data. This can help governments provide better services to their citizens and make more effective use of limited resources (Deloitte, 2021).

Improved access to government services is another opportunity presented by the implementation of a GC (Zhang *et al.*, 2022) especially by providing a single point of access. Citizen can access government services and information from anywhere, at any time, using any device. In this way, it facilitates the engagement of citizens with government agencies. Moreover, it offers access to the information they need and can help to improve transparency and accountability of their interaction within GC.

Enhanced data analytics capabilities of a GC are also perceived as opportunities (David *et al.*, 2023) for governments. Due to the increased amount of data generated by government actions, they can use cloud-based data analytics tools to get insights into the performance of their agencies, calls, programs, and services offered. Thus, governments can make superior decisions, increase their overall performance, and enhance their ability to provide optimal services to its citizens.

Moreover, the implementation of a GC can also foster increased innovation. By embracing cloud technology, governments can encourage innovation and experimentation and encourage the development of new solutions to complex problems (Zhang *et al.*, 2022), and share ideas and technologies with external

partners (Choi and Lee, 2015). This can allow governments to keep pace with the rapidly evolving technological (Zwattendorfer *et al.*, 2013) landscape and to remain competitive in a global context (Deloitte, 2021).

3. THE CASE OF ROMANIA AMONG CENTRAL AND EASTERN EUROPEAN COUNTRIES

Romania, as well as several other Eastern and Central European countries (David *et al.*, 2023) lag behind the Western European countries in the adoption of GC services. In the recent years, these countries have made significant progress and striving to catch up with Western Eu countries. Initiatives such as the European Union's Digital Single Market Digital (EU Digital Market, 2023), Digital Agenda for Europe (EU Digital Agenda, 2020) and The Recovery and Resilience Facility (EU Resilience, 2023) help in promoting digitalization and the adoption of GC services across the EU region, and it is likely that we will see further progress in the coming years (Deloitte, 2021). A comparison (Zwattendorfer *et al.*, 2013) among the initiatives and implementations towards GC in the Eastern and Central European countries (David *et al.*, 2023) is presented in Table 1.

Table 1. The current status of GC adoption in Eastern and Central European countries

Country	GC Adoption Status	Initiatives/Programs (weblinks)
Poland (Shah, 2018; Hieronimus <i>et al.</i> , 2022; Joshi, 2017)	Medium	Polish National Cloud (Chmura Krajowa) GovTech Poland https://www.gov.pl/web/govtech
Czech Republic (Ondrak and Neuwirth, 2017)	Medium	Public Administration Services https://portal.gov.cz
Hungary (Telecompaper, 2014)	Medium	Hungarian eGovernment https://nisz.hu/en/services/egovernment
Romania	Low-Medium	Romanian eGovernment platform https://www.e-guvernare.ro/
Slovakia	Low	Slovak Governmental Cloud https://www.mirri.gov.sk/
Bulgaria	Low	State e-Government Agency (SEGA) https://e-gov.bg
Croatia	Low	- e-Citizens Platform https://gov.hr/en/e-government/18
Slovenia	Low	Slovenian State Cloud DRO NIO - National Interoperability Framework Portal https://nio.gov.si/

Country	GC Adoption Status	Initiatives/Programs (weblinks)
Serbia	Low	eUprava - Portal of e-administration of the Republic of Serbia www.euprava.gov.rs
Montenegro	Low	eGovernment portal of Montenegro https://www.euprava.me/en

Source: computed by authors

As depicted from Table 1, the countries with low level of GC adoption status are in the early stages of implementing services related to GC. Although they have made some progress towards implementing GC services, they must pursue additional efforts to catch up with the leading EU countries (Wang *et al.*, 2016). The countries with low adoption of GC, are facing a range of challenges, including inadequate digital infrastructure, limited funding, and a lack of skilled IT professionals. But, with the help of EU’s projects and internal efforts, soon, these countries will be aligned in terms of IT infrastructure to the EU’s standards.

Estonia is considered Europe’s leader in GC adoption by building a digital society (Kattel and Mergel, 2019). In 2016, Estonia launched the Tiger Leap Initiative (e-Estonia, 2023), throughout a country-wide IT infrastructure development program, which provides a secure, scalable, and cost-effective platform for delivering government services. Ever since, the Estonian government made important progress in digitalizing the public services and moving in the cloud. Sources (e-Estonia, 2023) mention that over 95% of all government services available online. This has led to significant cost savings and increased efficiency, enabling the government to deliver better services to citizens and businesses.

The three Baltic countries (Latvia, Estonia, and Lithuania) are the states that have made significant progress in adopting GC solutions, having a high level of adoption status (Zwattendorfer *et al.*, 2013), as displayed in Table 2.

- Latvia has a dedicated Government Cloud Project aiming to provide efficient and secure IT infrastructure and services for the Government and public institutions (Van de Walle *et al.*, 2018).
- Estonia has a well-established Government Cloud (e-Estonia, 2023) that includes the widely recognized X-Road platform, which enables secure data exchange and interoperability among government agencies and other stakeholders (Kattel and Mergel, 2019).
- Lithuania has implemented Digital Government Platform and established a National Data Center, which serves as a central hub for government data storage and processing, facilitating digital services delivery (Ali, Soar and Yong, 2014).

Table 2. The current status of GC adoption in Baltic countries

Country	GC Adoption Status	Initiatives/Programs
Latvia (Joshi, 2017; Van de Walle <i>et al.</i> , 2018)	High	Government Cloud Project - Portal of State Administration Services https://latvija.gov.lv/
Estonia (e-Estonia, 2023)	High	X-Road, Estonian Government Cloud https://e-estonia.com/solutions/e-governance/government-cloud/
Lithuania (Ali, Soar and Yong, 2014).	High	Digital Government Platform https://digital-lithuania.eu/digitalgovernment/

Source: computed by authors

These Baltic countries are ahead in terms of GC adoption compared to Eastern and Central European countries mentioned in Table 1, which generally have moderate to low adoption status. The Baltic states have been known for their digital transformation (Zhang *et al.*, 2022) efforts and have been recognized as leaders in e-government and digital governance in Europe. The initiatives/programs in the Baltic states are well-established and have a strong focus on providing efficient and secure government IT infrastructure, services, and data management.

To follow the Baltic countries, in Table 3 there are mentioned the prospective steps that Romania should take.

Table 3. The steps that Romania could take to follow Baltic’s countries lead in terms of digitalization

Area	Steps Romania should take
Digital Infrastructure	Increase investment in digital infrastructure, particularly in rural and remote areas, and prioritize the development of high-speed broadband networks (Me, 2014)
Raising the awareness for Digital Skills	Develop and promote digital skills training programs for individuals and businesses, particularly in high-demand areas such as cybersecurity and data analytics (Livingstone, Mascheroni and Stoilova, 2023)
Digital Adoption among Business sector	Provide financial advantages and support for businesses to adopt digital technologies and processes, and develop public-private partnerships to support digital innovation (Kraus et al., 2022)

Area	Steps Romania should take
Cybersecurity Measures	Strengthen cybersecurity measures at the national and organizational levels, including through the development of cybersecurity strategies and increased collaboration with international partners (Livingstone, Mascheroni and Stoilova, 2023)
Digital Literacy in Education sector	Incorporate digital literacy and skills development into school curricula at all levels, and provide support and resources for teachers to integrate technology into their classrooms (Livingstone, Mascheroni and Stoilova, 2023)
Targeted Training for Workers	Develop targeted training programs for workers in high-demand industries and occupations, particularly in the areas of digital technology and innovation
Private Sector Involvement	Encourage private sector involvement in digital innovation and development through funding, tax incentives, and other forms of support (Păvăloaia <i>et al.</i> , 2019)
Lifelong Learning	Develop and promote lifelong learning opportunities (David <i>et al.</i> , 2023) for individuals, including online learning platforms, vocational education and training programs, and financial support for training and education (Păvăloaia <i>et al.</i> , 2019).

Source: computed by authors

By taking the steps illustrated in Table 3, Romania can work towards improving its digital infrastructure, developing a digitally skilled workforce, and promoting innovation and growth in its economy.

4. CONCLUSIONS AND FUTURE PATHS

To sum up, while the implementation of a GC presents significant challenges, it also provides numerous opportunities (David *et al.*, 2023) for governments to improve their operations and provide better services to their citizens. By addressing the challenges and taking advantage of the opportunities presented by cloud technology, governments can enhance their efficiency, transparency, and accountability, and remain competitive in an increasingly digital world.

The future perspectives for GC will be shaped by a range of trends and developments, identified in the literature, including:

Higher adoption of cloud services: As cloud services become more ubiquitous and cost-effective, governments are likely to increasingly adopt GC services (Abied *et al.*, 2022).

Emphasis on cybersecurity: As the growing threat of cyber-attacks, governments have to prioritize cybersecurity in their GC strategies, implementing appropriate security measures to protect against threats (Choi and Lee, 2015; Wang *et al.*, 2016).

Emerging technologies integration: GC should be integrated with emerging technologies such as Artificial Intelligence and the Internet of Things, enabling governments to deliver more elaborated services to its citizens.

Growth of shared services: Shared GC services are likely to expand, with governments collaborating to share resources and infrastructure, by minimizing costs and maximize efficiency.

Increased attention to (data) privacy: Due to the growing importance of data privacy, governments must ensure that their GC services comply with relevant regulations and protect citizens' private information.

Overall, the actual state of GC adoption varies widely across different countries and regions. While some countries have fully embraced GC and have established national GC platforms, others are just beginning to explore the possibilities of cloud computing in the public sector. Nonetheless, the benefits of GC are clear, and governments worldwide are likely to increasingly adopt GC services in the coming years to improve service delivery, reduce costs, and modernize aging IT infrastructure.

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REDUCING FOOD WASTE: A DOCUMENT ANALYSIS OF EUROPEAN REGULATIONS

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Abstract

This article provides a comprehensive document analysis of European regulations aimed at reducing food waste. The study examines various policy documents, guidelines, and legal frameworks related to food waste reduction in the European Union (EU) and its member states. The analysis reveals that the EU has taken significant steps to address the issue of food waste, with a range of policies and initiatives aimed at reducing the amount of food that is wasted throughout the food supply chain. The study identifies several key themes that emerge from the analysis, including the need for better measurement and monitoring of food waste, the importance of collaboration and partnerships between stakeholders, and the potential for regulatory frameworks to incentivize more sustainable food practices. Overall, the study suggests that European regulations have an important role to play in reducing food waste, but that a more integrated and holistic approach is needed to address the root causes of the problem. The findings of this research are relevant to policymakers, food industry actors, and other stakeholders interested in promoting more sustainable and efficient food systems.

Keywords: *food waste; European Union; sustainability.*

JEL Classification: Q18, Q56, Q58.

1. INTRODUCTION

Food waste is a pressing global issue that has negative environmental, social, and economic impacts. According to the Food and Agriculture Organization (FAO), approximately one-third of all food produced for human consumption is wasted each year (FAO, 2013). This represents a tremendous loss of resources, including land, water, and energy, as well as greenhouse gas emissions from food decomposition. In Europe, food waste has become a priority issue for policymakers, with the European Union (EU) taking steps to reduce waste and promote sustainable food systems. This article presents a document analysis of

European regulations aimed at reducing food waste, with a focus on prevention, redistribution, and recycling strategies. By examining the current regulatory landscape, we can better understand the challenges and opportunities for achieving a more sustainable food system in Europe.

The effectiveness of these regulations in reducing food waste has been assessed in various studies. A study by Gustavsson, Cederberg and Sonesson (2011) estimated that 89 million tonnes of food are wasted in the EU each year, and that “reducing food waste by 20% could save 48 million tonnes of CO₂ emissions”. Another study by Stenmarck *et al.* (2016) assessed the impact of the EU’s waste reduction targets and found that “they had led to a decrease in food waste in some EU countries, but that more action was needed to achieve the targets”.

In the same paper (Stenmarck *et al.*, 2016) it is suggested that producers and consumers are the ones responsible for the “majority of food waste”. Yet, being the ones in the middle between producers and consumers, retailers are the ones with a very important role in the food waste chain (Brancoli, Rousta and Bolton, 2017), some of the reasons why they waste food include “inefficient store operations and replenishment rules, excessive requirements for product quality and standards and demanding customer behaviour” (Teller *et al.*, 2018). However, „studies about the important role of supermarket managers in reducing food waste at the store level are still scarce” (Moser, 2020).

Until recent years, food waste, even though existed, has been neglected given the abundance of food available, especially in Europe. This ignorance has led to „major amounts of waste, mainly at primary production and consumer levels” (Halloran *et al.*, 2014), this leading to the need for improvement in the food waste management sector in recent years.

Awareness of what food loss and food waste is has grown tremendously in the past years and the European Union adopted legislative measures in order to make member states, producers and consumers to adopt more sustainable and environmentally friendly practices. We consider at this point that it is necessary to clarify the meaning of „food waste” and „food loss”. Waste is split into two categories according to its occurrence: loss „occurs before the food reaches the consumer as a result of issues in the production, storage, processing and distribution phases” and food waste „refers to food that is fit for consumption but consciously discarded at the retail or consumption phases” (Harvard School of Public Health, 2023).

We are addressing the food waste issue in the context of the Sustainable Development Goals (United Nations, 2015) taking into consideration especially goal no. 12 „Ensure sustainable consumption and production patterns”. The Sustainable Development Goals set the objective of cutting in half the food waste losses by 2030 (Hagedorn and Wilts, 2019). Although, in order for the countries,

producers and consumers to help achieve this goal, legislative measures must be taken because the law is always the first step toward any effective change.

2. RESEARCH METHODOLOGY

The research design for this study is a qualitative research design. The reason for choosing a qualitative research design is that it is the most appropriate approach for analyzing documents in-depth, which is the primary method of data collection for this study.

Data Collection: The primary method of data collection for this study is document analysis. The documents to be analyzed include European Union (EU) regulations and policies related to the food waste phenomenon. We will conduct a thorough search of relevant documents from the EU official websites, academic databases, and other reputable sources.

Data Analysis: The data collected through document analysis will be analyzed using a thematic analysis approach. We will read and re-read the documents to identify patterns, themes, and categories related to the food waste phenomenon. The identified themes and categories will be coded and analyzed to provide a comprehensive understanding of the European regulations and policies related to the food waste phenomenon.

Ethical Considerations: The study involves the analysis of publicly available documents. Therefore, ethical considerations are not applicable for this study.

3. IMPORTANT REGULATIONS

Reducing food waste is an important issue, and there are several regulations that have been implemented in Europe to address this problem. To conduct a document analysis of European regulations, we considered analyzing the following:

- **EU Waste Framework Directive:** This directive sets out the legal framework for waste management in the European Union, including provisions for the prevention of food waste.
- **EU Platform on Food Losses and Food Waste:** This is a multi-stakeholder platform established by the European Commission to support the EU's efforts to reduce food waste.
- **EU Farm to Fork Strategy:** This is a strategy that aims to create a more sustainable food system in Europe, including measures to reduce food waste.
- **EU Packaging and Packaging Waste Directive:** This directive aims to reduce the environmental impact of packaging, including food packaging.
- **EU Circular Economy Action Plan:** This is a plan that aims to promote a circular economy in Europe, including measures to reduce food waste.

4. FINDINGS

4.1. The EU Waste Framework Directive

The increase in packaging waste has led the European Commission to develop and adopt Directive 94/62/EC of the European Parliament and of the Council of 20 December 1994 on packaging and packaging waste as amended by Directive 2004/12/EC of the European Parliament and of the Council of 11 February 2004, to help reduce packaging waste (European Commission, 2023a).

The European Directive requires manufacturers/importers to reduce the volume of packaging waste. In practice, it gives companies the opportunity to optimize their own technological processes, reduce the cost of the material needed to make packaging and save the funds needed to dispose of packaging waste.

Within the European Union, the following issues are regulated: Food labeling is intended to provide information to consumers about their content and composition. Labels facilitate the documented decision of buyers when purchasing a specific product. They are considered components of the packaging.

Food packaging and guarantee product traceability as well as identification of components used throughout the manufacturing, processing and delivery stages.

Recycling of packaging materials after use. There are various strategies to improve the chances of re-use. Packaging designers need to focus on creating packaging from which components can be easily separated in the future. The above-mentioned European Directive specifies that manufacturers/importers may apply an appropriate labeling and identification system on their packaging.

The European Directive has 3 main objectives (European Commission, 2023b): First, it is possible to prevent the generation of packaging waste by reducing its quantity, by imposing restrictions on excessive packaging and by promoting reusable and rechargeable packaging solutions. Secondly, high-quality recycling (in a "closed loop") can be incentivised by enabling all packaging on the EU market to become economically viable by 2030. And finally, it can reduce the need for primary natural resources and create a functional market for secondary raw materials, increasing the use of recycled plastics in packaging through binding targets.

4.2. EU Platform on Food Losses and Food Waste

The platform was established in 2016, bringing together all EU Member States and all actors in the food chain, with the aim of helping to define the measures needed to meet the sustainable development goals related to food waste, to exchange best practices and communicate the results achieved (European Commission, 2016).

An important element is that the platform promotes cross-sectoral cooperation and the exchange of good practices and results. The EU Food loss and

Food waste Platform aims to help all actors in the field redefine a food value chain where food waste is minimized and the added value of food produced is maximized, thus facilitating the transition to a circular economy and to more sustainable food systems.

As regards the composition of the platform, the Commission wanted to ensure not only a high level of competence but also a balanced representation of knowledge and areas of interest in the food value chain, taking into account its mandate and future areas of activity. The platform has a total of 70 members of these, 33 represent public entities – EU Member States, EFTA countries, EU bodies (Committee of the Regions, European Economic and Social Committee) and international organizations (OECD, Food and Agriculture Organisation (FAO) and UN Environment Program (UNEP)), and 37 represent the private sector, the latter were selected following a public call for applications.

Exchanges and dialog are also foreseen with organizations not represented in the Platform, through networks and advisory tools, meetings and public conferences. At the meetings of the Platform or its sub-groups, the Commission may invite other organizations on an ad hoc basis to provide additional competences in specific thematic areas. The Commission shall regularly publish information on the work of the Platform on its website and intend to transmit the meetings of the Platform on the Internet to extend its reach.

4.3. The Farm to Fork Strategy

Climate change and the reduction of biological diversity are imminent and lasting risks to food safety and sources of existence. The Farm to Fork strategy was launched by the European Commission to revolutionize the EU's agricultural system. The new strategy sets out the main directions in the EU's agricultural and food sector, by improving agricultural practices and a new food policy integrated into the full supply chain, in order to minimize environmental impact. a strategy for biodiversity conservation and farm-to-table strategy (European Commission, 2023).

The Biodiversity Agenda aims to tackle the main factors leading to biodiversity loss, such as unsustainable use of soil and water resources, overexploitation of natural resources, pollution and invasion of foreign species. The new EU policy aims to set binding targets for restoring destroyed ecosystems, improving habitats and protecting EU species, increasing the number of pollinators in agricultural land, reducing pollution, affording cities, promoting organic farms and improving the health of European forests.

The main goal is to convert at least 30% of Europe's land and waters into adequate protected areas and to fully restore biodiversity on at least 10% of the agricultural area. Another direction of the EU plan, the Farm to Fork strategy, aims to create a circular economy by minimizing waste by introducing biodegradable and/or recyclable products into production and marketing, 20

together with measures for transport, storage, packaging and food waste management.

The strategy also aims to encourage responsible food consumption and promote healthy food. With the introduction of new labeling rules, buyers in Europe will be informed about the provenance of food, its nutritional content and its environmental impact.

Therefore, this strategy aims to ensure that the entire process of the food chain, including production, transport, distribution, marketing and consumption of food, has a neutral or positive impact on the environment. The aim can be achieved by conserving and restoring land, freshwater and marine resources, which are essential to the food system; contributing to the mitigation and adaptation of climate change effects; protecting the health and well-being of land, soil, water, air, plants and animals; reverse the loss of biodiversity.

4.4. The EU Circular Economy Action Plan

According to the EU Circular Economy Action Plan, the transition to a more circular economy, where the value of products, materials and resources in the economy is maintained for as long as possible and waste generation minimized, is a crucial contribution to the EU's efforts to develop a sustainable economy, resource-efficient and competitive, low-carbon. This transition represents an opportunity to transform our economy and generate new and sustainable competitive advantages in Europe.

A circular economy will enhance the EU's competitiveness by protecting businesses from resource scarcity and price fluctuations, thereby contributing to new business opportunities and developing innovative and more efficient production and consumption modes (Mazur-Wierzbicka, 2021). It will generate new local jobs for all skill levels and provide opportunities for social integration and cohesion. At the same time, the circular economy will reduce energy consumption and help avoid irreversible damage to climate and biodiversity, as well as reduce air, soil and water pollution, which is caused by the exploitation of resources at a rate that exceeds the Earth's ability to renew them.

The strategy focuses on actions at EU level with significant added value. However, to make the circular economy a reality, long-term involvement at all levels is needed, from national governments, regions and cities to companies and citizens. Member States are encouraged to fully fulfill their role in the EU strategy by integrating and supplementing it with national measures. In addition, the circular economy needs to develop globally. Increased coherence in the EU's internal and external policy in this area will lead to mutual consolidation and will be essential for the implementation of the global commitments undertaken by the Union and the EU Member States, in particular the UN 2030 Agenda for Sustainable Development, And the G7 Alliance on Resource efficiency. This strategy will play a crucial role in achieving the Sustainable Development goals

(SDG) by 2030, in particular target 12 to promote sustainable consumption and production models.

Attention is focused on areas that use the most resources and have a high potential for circularity, thus concrete actions are proposed on:

- electronic devices and information and communication technology - the "Circular Economy Initiative in the electronics sector" to produce devices with a longer lifespan and to improve waste collection and treatment;
- batteries and vehicles – a new regulatory framework for batteries to improve durability and boost the circularity potential of batteries;
- packaging – the new conditions imposed on what is admitted to the European Union market, including the reduction of (overabundant) containers;
- plastics – the mandatory requirements for the content of recycled materials in plastics have been updated, with particular attention paid to both microplastics and bio-based and biodegradable plastics;
- textiles – a new EU strategy for the textile industry to strengthen competitiveness and innovation in this area and to encourage the EU market for textile recycling;
- construction and buildings – a global approach to a sustainable built environment that encourages circularity principles in the case the buildings;
- food – a new legislative initiative on re-use to replace packaging, utensils and disposable tableware with reusable food services products.

4.5. National regulations in Romania

The Government Decision no. 856/2002 regarding the record of waste management and for the approval of the list including waste, including hazardous waste

According to the ruling, companies producing waste are required to keep records of their management for each type of waste (Romanian Government, 2002). Entities authorized to collect, transport, temporarily store, recover, and dispose of waste, these companies must maintain records only for waste generated within their own activities. The annual centralized data on waste management is transmitted to local public authorities for environmental protection at their request. The reporting of the records of waste management collected, transported, temporarily stored, recovered, and disposed of is carried out by the authorized companies at the request of local public authorities for environmental protection or other central and local public administration authorities that have duties and responsibilities in the field of waste regime. In order to collect national data on waste management, the central public authority for environmental protection organizes together with local public authorities for environmental protection and other coordinated institutions the annual statistical reporting in this field.\

The Emergency Government Ordinance no. 92/2021 regarding the waste regime

The purpose of this emergency ordinance (Romanian Government, 2021) is to guarantee a high level of protection of the environment and of the health of the population by implementing the following measures: a) prevention and reduction of waste generation, as well as their efficient management; b) mitigation of the negative effects caused by the generation and management of waste; c) reducing the overall effects of resource use and increasing their efficiency, which are essential to ensure the transition to a circular economy and to ensure long-term competitiveness.

Law no. 217/2016 regarding diminishing food waste

Authorities around the world are looking for solutions to mitigate food waste, through educational programs that encourage public accountability, and through legal provisions that reward good behavior (for example, by providing tax credits for donated products) or impose rules on food management. In Romania, Law 217/2016 on the reduction of food waste was adopted (Romanian Parliament, 2016), which establishes a series of obligations for economic operators in the food sector. These include the development of an annual plan to reduce food waste, internal communication with employees on the subject, adaptation of production to market demand and ensuring traceability, crop planning according to the market, education and information on the prevention of waste of agri-food products, quantification of food waste and measures to redistribute/use surplus.

From a fiscal perspective, legal support (in the form of products) allows cost recovery through tax credit and appears to be a solution used in other countries to reduce food waste. The Fiscal Code also offers the possibility to decrease the costs generated by the disposal of goods with a near-expiration or no longer consumable term, if they comply with the provisions of the food waste law and/or are transferred for re-entry into the circuit, for conversion into compost or biogas.

In conclusion, limiting food waste is a legally regulated obligation, but by preparing a plan of measures that includes tracking the expiry date of the products, reducing the sale price before expiry, sponsoring the products or transmitting them for use in obtaining compost or biogas, economic operators may also obtain favorable tax treatment.

5. CONCLUSIONS

In the conclusions section, we are going to highlight to most important things included in the legislation analyzed in order to have a clear understanding of the matter studied.

EU Waste Framework Directive: This directive provides a legal framework for waste management in the EU and includes provisions for the prevention of food waste. Key findings include the need for member states to adopt measures to prevent food waste, the establishment of food waste reduction targets, and the encouragement of food donation and other forms of food waste reduction.

EU Platform on Food Losses and Food Waste: This platform brings together stakeholders from across the EU to support efforts to reduce food waste. Key findings include the importance of collaboration between different actors in the food supply chain, the need for improved data collection and sharing, and the promotion of best practices for food waste reduction.

EU Farm to Fork Strategy: This strategy aims to create a more sustainable food system in Europe, including measures to reduce food waste. Key findings include the importance of addressing food waste as part of a broader sustainability agenda, the need for better coordination between different policy areas, and the promotion of circular economy principles to reduce waste throughout the food supply chain.

EU Packaging and Packaging Waste Directive: This directive aims to reduce the environmental impact of packaging, including food packaging. Key findings include the importance of designing packaging for recyclability, the promotion of reuse and refill systems, and the need to reduce unnecessary packaging.

EU Circular Economy Action Plan: This plan aims to promote a circular economy in Europe, including measures to reduce food waste. Key findings include the need for better product design to reduce waste, the importance of promoting more sustainable consumption patterns, and the need for better waste management systems to ensure that resources are reused and recycled as much as possible.

Overall, the most important finding from these regulations is the recognition that reducing food waste is a crucial part of creating a more sustainable food system. While the specific measures and approaches may differ between different regulations, there is a common focus on preventing waste throughout the food supply chain, promoting circular economy principles, and encouraging collaboration between different actors. This highlights the need for a holistic and coordinated approach to reducing food waste in Europe, involving all stakeholders and policy areas.

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NOTARY DEED IN ELECTRONIC FORMAT AND REMOTE NOTARY DEED IN THE REPUBLIC OF MOLDOVA: DREAM OR UTOPIA?

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Abstract

In our days, the development of the state and society is seen indispensably by the integration of information's technologies. Being one of the basic pillars, which ensures the security of the civil circuit of goods, qualified notarial assistance has long been waiting for the adjustment of the legal framework and the introduction of the electronic notarial deed. By the Disposition of the Minister of Justice, a working group was formed in order to develop a draft law with the necessary amendments along. In addition to the ordinary process of drafting the legislative act, a project was recently initiated to modernize the legal framework as an emergency, targeting several areas, including the introduction of digital notary. The content of this research will reflect the history of development of the e-notary in the Republic of Moldova up to the current stage. The research will also contain an analysis of the legislation of other states, where electronic notarial deeds are already implemented, and those where the introduction of electronic notarial deed has failed. The author will differentiate between the electronic notarial deed and the remote notarial deed, as well as will try to identify the prerequisites for their implementation. Failure to adjust the project may have negative consequences, which will block the implementation of the electronic notarial deed in the Republic of Moldova, thus the research will identify some threats that may affect the appearance of the electronic notarial deed as a result of the adoption of the draft law presented to the Parliament of the Republic of Moldova and will intervene with some proposals to improve it. Additionally, will be examined the results (impact) of introducing of a new legal framework on the civil circuit security, which will deprive the notary by the necessary tools and by the clear regulation of the notarial procedure.

Keywords: *notarial deed; e-notarial deed; e-notarial document; remotely notarial deed; legal act.*

JEL Classification: K15.

1. THE STATE'S POSITION IN THE DIGITALIZATION OF NOTARY DOCUMENTS

The development of the economy depends on the state's position and capabilities. The notarial system is one of the state's resources. The shift towards

digitalization has been promoted for about 10 years now, being intensified from 2021 with the introduction of the Deputy Prime Minister for Digitalization role, under the Government Decision (GD) of the Republic of Moldova (RM) No. 118 of 12.08.2021, and in 2023 – with the Ministry of Economic Development and Digitalization, under the GD RM No. 29 of 16.02.2023.

Even though the promotion of a policy for the development of electronic notarial activity was not explicitly stipulated, this field has recently been receiving prompt and increased attention.

1.1 Policy documents

The development of the state's capabilities in the electronic field indirectly supports the emergence of the necessary conditions for the creation and promotion of electronic notarial activity. Tangentially, various aspects that are the subject of notarial procedures have found support for transformation into electronic format through policy documents related to other public and private services.

By GD RM, No. 235 of 13.10.2021, for the years 2021-2022, the creation of the necessary conditions for obtaining electronic signatures by the citizens of the Republic of Moldova abroad (para. 23.34.2) was promoted, as well as the normative framework and technical solutions for mobile electronic identity without specialized devices (para. 2.1.4, 2.1.9, 2.1.22), the normative framework for establishing the procedure for remote identification and verification of a person's identity using the eKYC (Electronic Know Your Customer) solution. Attention was also drawn to the emergence of the governmental service of electronic archive (e-Archive) (para. 2.2.7, 2.2.17, 2.2.23), and also the development of services alternative to notarial ones - drafting of the normative framework for the implementation of the unique electronic register of proxies (para. 3.10.3).

By GD RM, No. 89 of 28.02.2023, for the years 2023-2025, the policy related to the mobile electronic identity MobiSign (para. 7.2.10.) was continued, as well as the establishment of the procedure for remote identification and verification of a person's identity using the eKYC solution (para. 7.2.11.), the need for developing the existing register of real mobile guarantees (para. 8.2.14.), the creation of a new Register of wills and succession files (para. 8.2.11.), and the development of the Register of proxies SI "e-Procura" by reusing SIA (MPower) (para. 7.1.14.), which will continue to reduce the number of proxies subject to notarial authentication. To reduce the threat related to the low level of digital culture of the population, the development of citizens' digital skills is envisaged (para. 3.2.19.), and to ensure and streamline the necessary technical conditions, mandatory interconnection and interoperability, ensuring access to administrative data sources for all authorities (para. 7.2.1.). The need for a framework document for the field of digitalization is pointed out by the drafting of the National Digital Development Strategy for the period 2023-2030 (para. 1.2.41.).

GD RM, No. 90 of 28.02.2023, dedicated to the action plan for the year 2023, puts in the foreground and supports the approval of the National Digital Development Strategy for the period 2023-2030 (para. 2.1.), which was supposed to have been drafted, the implementation of the technical solution for mobile electronic identity without specialized devices on the signer's side (para. 2.8.), the promotion of the normative framework to stimulate the development and use of electronic services (para. 2.13.), and, additionally, the drafting of the Concept of the Governmental Service of Electronic Archive (e-Archive) (para. 1.21.), which was not achieved in the previous period.

Although not directly visible, the development of electronic notarial activity is reflected in the state's policy aimed at stimulating the development and use of the above-mentioned electronic services.

At the same time, Law No. 211 of 06.12.2021, which strategically provides for several areas of digitization in the justice sector for the years 2022-2025, does not stipulate anything about electronic notarial assistance.

1.2 Implementation of policy documents

Currently, out of all the nominated fields, the most advanced service being developed is the alternative to notarial assistance – the Register of representation powers based on electronic signature (MPower), which is expanding its scope. Parallel to this, solutions are being implemented for mobile electronic identity (MobiSign).

At the same time, Law No. 126 was adopted on 26.05.2023. Although it is meant to support the development of remote businesses, the content of this law goes beyond this objective, with new regulations being introduced for electronic and remote notarial assistance as well.

By the Order of the Minister of Justice (MJ) RM No. 141 of 06.06.2022, a working group was established for the adjustment of the normative framework for the elaboration of the Concept of the electronic notarial act and electronic notarial activity. However, the aforementioned law project was developed by the Ministry of Economy with the support of the Economic Council under the Prime Minister and USAID Moldova. It should be noted that so far, no concept of electronic notarial act and electronic notarial activity has been developed.

2. HISTORY OF INTEGRATING NOTARIAL DEEDS INTO ELECTRONIC FORMAT IN THE REPUBLIC OF MOLDOVA

Notaries in the Republic of Moldova do not draft notarial deeds in electronic format, in the sense of electronic documents, although certain activities in electronic format are carried out. According to art. 2 of Law No. 124 of 19.05.2022, an electronic document is defined as *content in electronic form, particularly in the form of text or sound, visual or audiovisual recording, to which an electronic signature or electronic seal has been applied.*

Some premises for electronic notarial activity have been forming for a long time, even some actions in this activity can be performed in electronic format, however, the notarial act as a result of these actions does not obtain electronic support.

2.1 Electronic notarial registers

Currently, notaries are registrars/operators only in two registers kept in electronic format: the register of movable real guarantees and the register of succession files and wills.

By GD no. 849 of 27.06.2002, the register of pledged movable goods was created, which was kept in electronic format. Currently, instead of the register of pledged movable goods, the register of movable real guarantees operates, created by GD no. 210 of 26.02.2016. The register of movable real guarantees is kept in electronic format, but the notary's electronic signature is only used for his identification in the system, without being applied to documents generated in the system. In other words, the system does not generate electronic documents.

By the MJ Order no. 38 of 03.02.2006, the register of succession files and wills was created, which is kept in electronic format. At present, this register contains information on succession files and wills prepared since 14.09.1998. This register is kept in electronic format but does not generate electronic documents, as no electronic signature is applied.

In accordance with art. 25 para. (1) of Law no. 71 of 22.03.2007, starting with 10.11.2021, in the RM all state registers are to be kept in electronic form. Art. 25 of Law no. 246 of 15.11.2018 does not stipulate a specific form of notarial registers, this being approved by the MJ. And para. 2 of the MJ Order no. 329 of 10.12.2019 obliges all notaries to keep all notarial registers approved by this order on paper.

Other electronic notarial registers are not currently used, although legislation contains obligations of the notary to register in the electronic register of powers of attorney.

2.2 Electronic signature

Some time ago, in the opinion of Cara-Rusnac (2012, pp. 86-93) the use of electronic signature in notarial activity seemed to be a myth, now every notary holds at least one qualified electronic signature, which is used in notarial activity. Mostly notaries use it in related activities - for reporting, correspondence, etc., it is not applied to notarial deeds. At the same time, according to art. 5 para. (6) of Law no. 246 of 15.11.2018, starting with 01.03.2019 there is no prohibition on the use of electronic signature on notarial deeds.

According to art. 187 para. (2¹) of the Tax Code (Law RM no.1163 of 24.04.1997), starting with 01.01.2017 notaries submit tax reports using automated methods of electronic reporting. All tax reports are electronic documents.

According to para. 4 of the Order of the Main State Tax Inspectorate no. 16 of 14.01.2013, starting with the fiscal period year 2012, notaries submit information regarding certain contracts in electronic form with the application of the electronic signature. The notary is not able to download electronic documents from the system, which violates Law no. 124 of 19.05.2022.

According to para. 30 of the Rules for completing the Report on the professional activity of the notary, approved by the Decision of the Notary Chamber Council no. 2 of 12.11.2019, starting with the year 2019, notaries apply electronic signature on the report and send it by electronic mail to the Notary Chamber.

Other reports/statements are submitted on paper.

2.3 Related competences

In accordance with art. 50 of Law no. 246 of 15.11.2018, the notary is obliged, by applying the electronic signature, to perform the provisional registration of certain notarial acts in the real estate register. For technical reasons, this obligation cannot be fulfilled to this day.

Under art. 56 of Law no. 246 of 15.11.2018, the notary has the competence to certify the content of web pages. In this case, a certificate is issued on paper. Art. 57 of Law no. 246 of 15.11.2018, assigns to the notary the competence to confirm the time of data collection from the advertising register, kept in electronic form, to which he has access. In this case, a certificate is issued on paper.

2.4 Interoperability

In exercising their service competencies, notaries are provided with access to public registers under the legislation regarding data exchange and interoperability. According to art. 3 of Law no. 142 of 19.07.2018, the notary is recognized as a private participant in the data exchange. Art. 10 of Law no. 69 of 14.04.2016 guarantees the notary access to any necessary information, including online, but in reality notaries are forced to justify access to specific data by special provisions. It should be noted that, in most cases, the notary's access is guaranteed for a fee, and the information held in several public registers and accessed by notaries is not up-to-date and is not complete.

3. MAIN DIRECTIONS OF IMPLEMENTING NOTARIAL ACTS IN ELECTRONIC FORMAT

Electronic notarial activity includes a diversified complex of procedures, which the notary will be able to carry out, depending on the received request.

Obviously, if the applicant is not physically in the presence of the notary, and the notarial act requires more actions from the notary, the risk of errors is increasing. It should be noted that each state should assess its own capabilities to determine the forms of realization of electronic notarial activity, taking into

account both the needs of society and the costs of creating and maintaining the informational system that is expected to technically ensure these competencies.

3.1 Act in electronic format

Most often, for simplicity, the notarial act in electronic format is called an electronic notarial act. This mistaken simplification is also admitted in Law no. 126 of 26.05.2023. De jure, the format does not change the legal effects of the notarial act. The adjective "electronic" in the notarial procedure only signifies the tool used by the notary in this procedure: an electronic device instead of a pen and paper. Assuming that the notarial act itself becomes an electronic one, we can conclude that the procedure for fulfilling the notarial act has become an electronic (automated) one, which does not require the presence of a professional in the field (notary), with functions of directing and strictly following the legal procedure. For this reason, the term "electronic notarial act" is not correct, but rather "notarial act in electronic format".

According to the criterion of how the content of the notarial act is stored, we can highlight:

- notarial acts on paper,
- notarial acts in electronic format.

In turn, a notarial act can become electronic:

- being drafted entirely on paper, then scanned and electronically signed by the notary in order to be preserved in electronic format and for this document to circulate electronically;
- being drafted on paper and later scanned and electronically signed by the notary;
- being signed with a special pen on a touchscreen by the applicant and electronically signed by the notary;
- being signed with the applicant's electronic signature and the application of the notary's electronic signature;
- a combination of the above variants.

In this case, all obligations are carried out by the notary personally, and the result is recorded directly, without the use of additional technical tools. As a consequence, to implement notarial acts in electronic format, it is necessary to clearly regulate the legislation in the field of electronic archives and create the necessary conditions for preserving these electronic documents.

In addition to the archive, a special regulation is required to describe the notary's competencies to convert a document from paper to electronic and vice versa, which will form the basis of notarial acts in electronic format. However, this competence is missing in Law no. 126 of 26.05.2023.

3.2 Remote notarial deed

Based on the communication criteria between the applicant and the notary, we can identify:

- the applicant is in the presence of the notary who drafts the notarial act;
- the applicant is remote from the notary drafting the notarial act, but in the presence of another notary;
- the applicant is remote;
- a combination of the above-mentioned cases. For example, the seller is in front of one notary, and the buyer is in front of another notary, and a single sales contract is authenticated; or the seller is in front of the notary, and the buyer is remote;
- the presence of the applicant is not necessary for drafting the notarial act, communication being only in writing (the applicant only sends the notary a digitally signed request and pays for the notary assistance). For example, securing evidence by certifying the content of a web page.

The notary is bound to respect the rules for drafting general notarial acts, so that the result of notarial activity is identical, regardless of whether the applicant is remote or in the presence of the notary. It's clear that without physical contact, the risk of fraud in the notarial assistance procedure increases, and the notary needs both the necessary technical support to combat fraud and specific technical knowledge to detect such fraud. The speed of IT development versus the professional capabilities of an individual notary results in increased fraud risk. Only the professional notarial body or the state can effectively compete in the fight against fraud.

Fraud is a risk not just for the notary, but for anyone who accepts the drafting of the notarial act at a distance and risks being harmed. Most often this fraud is seen when using different payment systems through electronic devices (smartphone app, webpage, etc.).

In the case of remote notarial deeds, the technologies offered to the notary must solve several tasks to ease the notary's tasks (e.g., establishing the identity of the applicant), even though other tasks become more complicated (e.g., verifying the applicant's consent).

3.3 The main difference between a notarial act in electronic format and a remote notarial deed

It is incorrect to view the remote notarial act as a variety of the notarial act in electronic format. Even a notarial act performed remotely can be confirmed by the notary by issuing a document on paper. At the same time, neither does an notarial act in electronic format necessarily mean that it was prepared remotely from the notary. Both these forms must be considered separately. However, this mistake is most often observed in practice. Studying the provisions of Law No. 126 of 26.05.2023 concerning the notarial procedure, we find that there is no clarity

regarding the tools to be used by the notary for drafting electronic notarial acts and, separately, for the notarial act performed at a distance. Some specific provisions (e.g., the prohibition of drafting remote notarial acts mentioned in art. 5¹ para. (5), or the prohibition of enforcing notarial acts drafted on paper in electronic format in art. 43 para. (11) of art. IX), which limit the realization of some competences, do not go beyond this problem, which should have been solved by the concept.

4. FUNDAMENTAL PREMISES FOR THE DIGITIZATION OF NOTARIAL ACTS

This paper does not aim to identify all the premises necessary for the digitization of notarial acts, but only to discuss some aspects which, in the author's opinion, require special attention.

4.1 Premises for drafting notarial acts in electronic format

The isolated development of only electronic notarial activity separate from the state's IT technologies is impossible. Under these circumstances, we can highlight the following premises:

- *State information systems must be created, the data of which will be processed during the drafting of notarial acts*

Of course, if the state is behind in the development of its own technologies, the promotion of electronic notarial assistance will require more resources, which will have to cover the lack of these information systems. For example, in Brazil, the provision of electronic notarial assistance uses a unique register of notary clients, a unique register of final beneficiaries, a national center for digital authentication. In the Republic of Moldova, there are already certain state information systems, such as the state register of the population, the state register of legal entities, the state register of individual entrepreneurs, etc., the data of which can be processed in the exercise of notarial activity, to avoid duplicating information systems. At the same time with the development of electronic notarial activity, the state promotes the policy of developing the state register of legal entities, which is expected to provide more operational and qualitative information about legal entities and certain individuals.

At the same time, there is also the real estate register, which keeps a record of real estate and the holders of rights over these properties. Notaries do not have direct access to this register, and the development of the information system that will ensure the smooth operation of this register has been underway for several years.

Parallel with information systems, related public services must also be developed, such as: electronic authentication/identification services, electronic signature application services, electronic archive storage services, etc.

Naturally, the lack of these and other data/information systems, as well as the related electronic public services in the notarial procedure does not lead to the impossibility of providing electronic notarial assistance, but requires more resources to promote them, as these resources and services must be developed. For example, in France and the Russian Federation, notaries have created public key certification centers (qualified trust service providers), through which electronic signatures used by notaries and applicants for notarial deeds are created.

- ***The information in the state information systems must be truthful, complete, and current***

For good functioning, the information used in notarial activity must be truthful, complete, and current. At the same time, the state must institute this presumption. In the Republic of Moldova, this presumption is instituted in relation to public registers, although the information from many information systems does not meet these criteria.

There is no perfect information system, as any system is an organism of continuous development. A simple historical look shows us that the same state population register appeared about 30 years ago, the real estate register about 25 years ago, and the notary office about 18 centuries ago. Thus, notaries have drawn up notarial acts beyond the appearance of information technologies and information systems. As a result, these information systems are just a toolkit that can facilitate the work of the notary. Indeed, the use of truthful, complete, and current information will increase efficiency and operationality in the drafting of notarial acts, but it does not lead to the impossibility of drafting electronic notarial acts, in general.

- ***free and unrestricted access of notaries to state information systems and public services provided***

If notaries do not have access to these information systems (it should be noted that notaries have obtained this access through a system-consumer interoperability system only about 5 years ago), the preparation of notarial deeds on electronic support will be possible, but notaries will have to duplicate the state functions in the evidence of processed data, which leads to an increase in the self-cost of notarial assistance. It should be noted that notaries are state-authorized representatives with public functions, for which reason it would be illogical to grant powers from the state and limit access to resources necessary for the effective realization of these powers.

The notary benefits from financial autonomy. Thus, payment for the notarial assistance provided must cover the notary's expenses, and incompatibility does not allow the simultaneous conduct of other paid activities, with a few small exceptions. As a result, this funding ultimately falls on the applicants for notarial deeds, who pay this fee. In this context, paid access to information systems and/or public services increases the self-cost of notarial assistance which, ultimately, must be borne by the applicants. From these considerations, the Soviet approach

of providing free notarial assistance (exempt from payment), regardless of the beneficiary, is fundamentally incorrect, especially when the applicant is the state or public authorities, as in this case notaries find themselves in a situation where their work will not be remunerated by force, which violates the provisions of the Supreme Law.

I reiterate, paid access to information systems and public services does not make it impossible to prepare notarial acts on electronic support, it only increases their cost, so the accessibility of this assistance becomes less attractive to applicants.

In countries where all or most of these services and systems are developed by notarial professional bodies, the self-cost of notarial assistance has not increased, because the costs of manual and paper data processing have been directed towards electronic processing without any added value being applied to this self-cost (e.g., France, Russian Federation). In countries where these systems and services are offered by the state, the amount of payment depends on how notaries have access to them.

- ***a true partnership in relations between notaries and the state, through competent public authorities and institutions***

Insofar as the state, on the one hand, stipulates a payment for access to these information systems and public services, and, on the other hand, develops alternative services to notarial assistance, arguing that these services are cheaper - we observe a lack of consistency or the desire to liquidate the notary, as a public institution created by the state in the exercise of its competencies for the benefit of society.

Currently, notaries are only consumers of information systems and public services. The development of information technologies in this field by notaries, individually, or by the Notarial Chamber, as a professional body, has not been prohibited by law.

According to Law No. 126 of 26.05.2023, the state information system through which notarial deeds will be registered electronically in the state register of electronic notarial deeds will be developed by the Ministry of Justice, as the owner, with the support of the "Electronic Governance Agency" Public Institution. In other words, all investments already made for the development of IT technologies will not be compensated by anyone, and the role of the Notarial Chamber as a true partner of the state has been undermined.

The development of the system intended for notaries by an institution other than the Notarial Chamber directly affects the effectiveness of this information system and implicitly creates obstacles in the digitalization of processes related to the preparation of notarial deeds, which notaries are obliged to carry out. However, the state will not invest in these systems, and notaries will be limited in their development on their own and freely, being dependent on a foreign owner.

- *the existence of legislation regarding the electronic archive*

Above, it was already reported that there is currently a lack of normative framework regarding electronic archive services. Without clear regulation in this field, notarial deeds in electronic format cannot exist.

- *sufficient funding*

The creation, development, maintenance of information services and information systems requires sufficient funding. The lack of funding does not allow the creation and development or, at the maintenance stage, increases the risk of fraud. In countries where the number of applicants and, implicitly, notaries is large, the financial burden for funding per notary is smaller than in countries where this number is much lower. In the Republic of Moldova, there are less than 300 notaries. Autonomous funding cannot cover all these expenses and requires support from partners (state, foreign and international professional organizations, etc.).

- *recognition of the mandatory legal force of electronic documents*

Currently, the legislation of the Republic of Moldova contravenes the sanctions the unjustified refusal to accept an electronic document. Therefore, the use of electronic documents prepared by the notary should not create a problem in essence, although the entire society needs to adjust its own technologies to be able to work with notarial deeds in electronic format.

- *training of notaries and applicants*

To prepare notarial deeds in electronic format, notaries must be appropriately trained. Lack of training can lead to an increase in errors.

Training of applicants is more important. However, the sudden intervention of information technologies in the citizen's life puts him at risk. On the one hand, these technologies offer him development advantages, and on the other hand, they pose risks of becoming a victim of fraud, because the responsibility for using these technologies is shifted from the state to the citizen, and the latter does not know methods to protect his interests and rights. It should be noted that, sometimes these methods are for an additional fee, which the citizen must cover from his own account.

4.2 Prerequisites for performing notarial deeds remotely

The premises reported above for drafting notarial deeds electronically are largely relevant and to remote notarial deeds. In other words, the development of information technologies must be more in-depth and specialized in this field, and the training of notaries and citizens more rigorous. In places, even the state is not interested in developing certain technologies necessary for performing notarial deeds remotely. For example, in some states to reduce the overhead cost of notarial assistance, the remote notarial deed is performed via videoconference, but without the use of artificial intelligence for additional identification of the applicant. Even in France, notaries use artificial intelligence for personal

identification provided by a private company and not created by the notarial professional body or by the French state. As a result, we supplement them with:

- *the development of artificial intelligence necessary for use in this process*

Dmitric (2006, p. 120) wrote that the notarial form demands the use of paper, as the civil circuit and the state registration system are based on documents prepared on this support. Currently, in the Russian Federation, electronic notarial deeds are used very frequently. Even the presentation of notarially authenticated contracts to the state registration body of real estate is made in electronic format.

In the Republic of Moldova, no artificial intelligence has been implemented in any field, including fields related to notarial activity, which presupposes the necessity of using foreign artificial intelligence.

The use of artificial intelligence in the exercise of public functions primarily requires a reassessment of national values, and new ethical standards should be developed that would correspond to subject-object relationships instead of the usual subject-subject approach. Moreover, in specialized literature, opinions can be identified according to which the emergence of absolutely autonomous artificial intelligence can change the usual paradigm, in which intelligence is a human resource, into one where man becomes a resource for artificial intelligence. In any situation, before using artificial intelligence developed in the private sector for the public domain, it is necessary to exclude any risk of using this intelligence for illegal purposes. As a result, as Zaloilo (2021, p. 102) reports, *delegating to information systems that operate on the basis of artificial intelligence technology some competencies of state authorities must not violate the rights, freedoms, legitimate interests of citizens, or threaten national security.*

Considering that the procedure for performing notarial acts is similar also for the case of drafting the remote notarial act, we will outline some basic elements (stages) of the authentication procedure of the document. Bărbieru and Macovei (2018, pp. 454-458) highlight the following stages:

a) establishing the identity of the parties

Some benchmarks regarding the establishment of identity can be found in my work (Pistriuga 2022, pp. 254-256). Establishing a person's identity remotely is not an easy task at all. The simplified position when only the electronic signature is used for identifying the person is not applicable to notarial procedures, as it does not report who used this signature. Indeed, anyone who knows the access password to the electronic signature can use it.

In the private sector, for establishing the procedure for remote identification and verification of a person's identity, sometimes the eKYC (Electronic Know Your Customer) solution is used. The same solution is proposed to be legally confirmed in the Republic of Moldova (it should be noted that currently no state has regulated the use of a specific technical solution for this purpose). At the same time, for example, *eKYC was advocated by the Vietnamese Government with the*

release of Decree No. 87/2019/ND-CP (effective from Nov 14, 19) which allowed financial institutions to decide whether to meet the client in person when the relationship is established for the first time. If not meeting the client in person, the reporting entity must apply measures, methods and technology to identify and verify the client. (Nguyen, 2020)

It should be noted that this identification system is more advanced than the simple use of electronic signatures, as it assumes more steps of identification. However, using this technology requires the system's access to state information resources to compare the data presented with the system's data, which raises the question of national security and personal data protection.

The use of eKYS technology, as well as any similar technology based on artificial intelligence, also requires the delimitation of responsibility for possible technological errors, so that the notary remains responsible only for the exact observance of the technological process, excluding liability based on wrong conclusions/results of this technology. It is unlikely that for procedures that can generate large scale damage, the use of this technology will be accepted by investors. Currently, this technology is used in the payment system to ensure remote payments.

In this context, it becomes clear that no private company will want to take responsibility for large value transactions (as this can lead to the bankruptcy of the private company), nor will the state guarantee the result of applying these technologies. Accordingly, the responsibility must be assumed by the notary himself, for which reason the application of this procedure is possible only for procedures with small values, which will not lead to the bankruptcy of the notary.

b) obtaining consent

Unlike notarial certification and legalization procedures, which generally do not require obtaining consent and checking the person's discernment, in authentication procedures this step is mandatory.

At present, no artificial intelligence has been identified that would ensure the consent-taking process.

The process of expressing consent in the banking system (this process was taken, given that remote services in the banking system have been applied for a long time, respectively, there are scientific papers that address this topic) is described by Bocşa (2010, pp. 191-192) as follows: by double click. This approach is based on the necessity of perfect understanding of the actions by the subject (which requires precontractual information/instructions, in other words, special preparation/training), with the guarantee of the person's right to revoke (in case of error/misunderstanding).

In another work, Duma and Şumandea-Simionescu (2022, pp. 375-376), consider that authorizing the operation of making the electronic payment is, therefore, implicitly expressing consent. And before authorizing the operation, the strict customer authentication process must be ensured, which *is based on two or*

more elements that are included in the knowledge category (something only the user knows: password, answer to a secret question), possession (user's phone or other electronic device, an electronic certificate etc.) and inherence (biometric authentication – facial or fingerprint) and results in generating an authentication code – so-called multi-factor authentication. The client authentication procedure largely corresponds to the stage of establishing identity and is included in the respective technology.

And regarding the authorization of the payment operation, it is mentioned that it must be agreed with the payer in advance. In other words, before carrying out any payment operation, the payment service provider and the payer must negotiate the form in which the payer's consent can be expressed, so that any other operation carried out by the payer is not qualified as expressing consent. In this context, subsequently the payer will not be able to revoke the operation performed on the grounds of error/misunderstanding of this or its legal effects.

Unlike payment service providers, who enter into contractual relations by concluding a contract with the payer/client, the notary does not conclude any contract with the applicant for the provision of notarial assistance. As a consequence, the form of consent must be expressly provided for by law, or the legal framework must stipulate that remote notarial acts can only be drawn up on the condition that the applicant has previously submitted to this notary an application in which he has informed that he wishes to benefit from this form of communication with the notary and about the form of expressing consent that is to be recognized by the notary, as well as the form in which consent is to be considered defective (for situations where the externalization of the will is not free but affected by defects of consent, such as lesion etc.).

Taking consent is a long-lasting stage, given the fact that it presupposes the study of the project by the applicant, the reading of the project by the notary, the explanation by the notary of the legal effects of this act, etc.

c) signature of the parties and date of the document

Stereotypically, expressing consent consists in applying the signature on the document. In the case of remote notarial acts, the application of the holographic signature is impossible (probably, with the exception of the case when the document was previously signed, and the act consists in confirming the fact of signing). In this case, the qualified electronic signature must be applied, which the applicant must have.

Any electronic signature also contains a timestamp. Accordingly, the date of the document results from the timestamp applied by the system.

In this context, an incorrect approach must be observed in the Concept of the Automated Information System "Registry of representation powers based on electronic signatures" (MPower), which states that *the request for notarially authenticated powers of attorney in the context of providing certain services, to the detriment of a non-authenticated power of representation, is generated by the*

need to ensure that the signatures are genuine, which contributes to the avoidance of fraud (GD no. 375 of 10.06.2020). However, the authentication procedure is not based on the application of the signature, but on the expressed consent, and the signature applied in front of the notary only confirms the fact that it was applied by the competent person and with valid consent, understanding the legal effects of the signed act. No current technological process can perform this task.

- *development of the platform for videoconference*

To prove compliance with the rigours of a remote notarial act, a separate platform is needed that will ensure the security and secrecy of the data communicated at the state level (therefore, private videoconference systems, such as zoom, viber, google meet, microsoft times etc., cannot be accepted), and will ensure the recording and storage of these records.

Initially, for example, in Georgia, the drafting of remote notarial acts was allowed using only a private videoconference platform, with the assistance of witnesses and the recording of this session. We consider that the use of private platforms does not comply with the legislation in the field of personal data protection and cannot guarantee the correct conduct of the process, by assuming responsibility for the functionality of the platform. And the application of only the platform for videoconferencing without the use of artificial intelligence in establishing the identity of the applicant increases the risk of fraud.

In any situation, the technologies used, including artificial intelligence, are only tools that the notary must use in the drafting of these notarial acts, which cannot replace the role of the notary and his function in the procedure of providing notarial assistance.

4.3 Example of other states

The Republic of Moldova is not the first state that intends to implement electronic notarial assistance. In this context, we can exemplify some states, where electronic notarial activity is advanced through special technologies used in this field, such as France and the Russian Federation. At the same time, the countries imposed by objective circumstances (such as the Covid-19 pandemic), which have instituted the provisional period of applying electronic notarial assistance, among which we can name: the Kingdom of Belgium and the Portuguese Republic, deserve attention. Several states have tried to implement a simpler system to ensure the security of the procedure, by recording the videoconference, without using artificial intelligence in establishing identity.

The preparation of electronic notarial acts has been developed gradually and consistently with information technologies and with the creation of the necessary conditions for data encryption and ensuring the conditions for electronic archiving of documents. As a result, electronic documents containing the notarial act are used in several countries, including European ones.

Remote notarial acts do not enjoy such widespread use. The impetus for more countries to use remote procedures was the Covid-19 pandemic. Thus, in order not to restrict citizens' access to notarial assistance, several notaries were forced to develop their own special equipment (such as own platforms created by native notarial organizations or by the branch ministry) or to use simpler procedures. For example, in the Kingdom of Spain, Lithuania, Brazil, the platforms are created by national notarial organizations, and in the Portuguese Republic the platform was made available by the Ministry of Justice (2023). However, the notary in Lithuania alone establishes the method of carrying out its remote notarial duties.

Although several notarial acts are drafted remotely, the authentication procedure for legal acts is usually exempted when the communication between the notary and the applicant is at a distance. This approach is largely dictated by uncertainty regarding the identification of the applicant and the verification of the applicant's discernment and consent.

Recently, given the adoption of Directive (EU) 2019/1151 of the European Parliament and of the Council of 20 June 2019 amending Directive (EU) 2017/1132 as regards the use of digital tools and processes in company law, several European countries have introduced the procedure for remote authentication of only commercial company formation acts (for example, Germany, the Kingdom of Belgium, Italy, the Portuguese Republic, the Kingdom of Spain). It should be noted that, the procedure for authenticating amendments and additions to the constitutive acts in most countries remained with physical presence.

The widest competence of the notary to draft notarial acts remotely is identified in the Russian Federation. More detailed can be studied in the work of Ushakov (2021), and after the latest modifications, in the work of Volos (2023, pp. 50-61). However, both in France and in the Russian Federation the process of implementing these technologies lasted more than 10 years, unlike the 3 years provided for in the legislation of the Republic of Moldova.

At the same time, in the case where the legislation only allowed the drafting of notarial acts in electronic format, without providing it with the necessary equipment, the notary, for various reasons, including financial and security, could not ensure the implementation of this process. In this case, the example of Romania can be seen, which adopted Law no. 589 of 15.12.2004, but notarial acts in electronic form are not drafted in its realization.

5. THREATS TO IMPLEMENTATION OF NOTARIAL ACTS IN ELECTRONIC FORMAT

The introduction of new forms of notarial assistance, which can be applied including to authentication procedures, requires the evaluation and avoidance/reduction of these threats. Currently, the biggest threat that exists is the

impossibility of drafting notarial acts both those in electronic format, and remote notarial deeds, due to:

- lack of necessary technological instruments;
- the absence of a clear and efficient delimitation of competencies in the field of notarial procedure in electronic format and at a distance;
- lack of a regulatory framework that would clearly and realistically describe these procedures;
- the notary's assumption of responsibility for processes that are outside his control.

The informative note to Law no. 126 of 26.05.2023 does not highlight the aforementioned threats, including the one resulting from the lack of technological tools necessary for the implementation of notarial acts in electronic format and remote notarial deeds, although without these technologies their realization is impossible. Even in the economic-financial justification chapter, the necessary amount for the implementation of this law is not specified, only reflecting that the cost of information systems will be covered from the account of international development partners. Later, maintenance expenses will be included in the notary fee. For example, Article 50 of Law no. 246 of 25.11.2018 has not been implemented to date, for technical reasons.

It is at least puzzling that the Notarial Chamber has tried several times to promote the development of its own information system, which was not supported by the Ministry of Justice on the grounds of lack of policy document in this area, and in the end, being the most interested in implementation, it has no competence in this field (except for consultation). Consequently, the creation and implementation of the system requires additional costs for third parties who will manage this system and offer it to notaries, expenses that will ultimately be included in notarial fees to emphasize additional financial expenses for the final applicant.

The approved legal framework does not contain a clear regulation of the notarial procedure with instruments that can be realized under the conditions of the Republic of Moldova. And the obligation of the Ministry of Justice to regulate these procedures, inserted in the law, does not solve this problem, in light of the fact that to date all the necessary normative acts in the execution of Laws no. 69 of 14.04.2016 and no. 246 of 15.11.2018 have not been adopted.

Considering the basis that imposes the necessity of the authentic form of legal acts, the introduction of these procedures should be examined in great detail and strictly regulated to protect the civil circuit. In the absence of the necessary, clear and real regulatory framework for implementation, this law may negatively affect the national economy (by challenging and cancelling notarially authenticated contracts) and demotivate foreign investors, who risk losing properties, without sufficient guarantees in the security of the civil circuit, instead of attracting foreign

investment. The same fact will demotivate notaries to apply this procedure to avoid responsibility for acts performed outside their control.

6. CONCLUSIONS

Cara-Rusnac (2012, p. 93) exposed that the citizen must choose on what support the notarial act should be drawn up: electronic or paper, and that we cannot guarantee 100% data security in electronic format just as fraud is committed when drafting acts on paper support.

While fully agreeing with the right to choose, I believe that fraud in the drafting of acts on paper support is largely due to the lack of a clear regulatory framework. And if these frauds are due to the notary's fault, the notary risks with his own license and freedom for the act committed, which will eliminate such a notary from the notarial system. For this reason, I do not consider it relevant to repeat the mistakes detected in the drafting of notarial acts on paper and against the drafting of notarial acts in electronic format and remote notarial deeds, but to eliminate them through a clear and relevant regulatory framework to the realities of the Republic of Moldova.

In conclusion, I consistently support (Pistriuga, 2015, p. 167) the desire to implement in the Republic of Moldova the notarial act in electronic format and the remote notarial acts, but Law no. 126 of 26.05.2023 does not allow the realization of this ambition, hence it should be conceptually revised in this regard.

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THE EFFECTS OF THE PANDEMIC TIMES ON HUMAN RIGHTS AND BUSINESS ENVIRONMENT

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Abstract

Although some time has passed since the start of the pandemic, its consequences are still being felt, not only at the national level, but also at the EU level, and an immediate consequence is the beginning of a new global crisis. The devastating economic effects that Covid-19 had on human rights and contractual relationships have particularly affected the entire world, given that businesses experienced supply interruptions, and many contracts could no longer be executed or were executed improperly, indirectly being affected fundamental consumer right. The exact number and scope of companies that suffered losses leading to bankruptcy and permanent market exit is not clear, but according to a survey conducted by the World Bank's Enterprise Analysis Unit, different approaches have been developed to measure the virus's impact on the private sector and individuals. In this context, not only entrepreneurs suffered significant losses, but also consumers of products and services, who were automatically transferred for online purchase with risk of non-conformity and delays.

The aim of this paper is to discuss a series of progressive steps that must be followed after pandemic times for the protection of human rights and business enforcement with a detailed analysis on the importance of special internal regulation for the for overcoming situations of force majeure. Even though we are currently in a post-pandemic period where everything seems to have returned to normal, we still believe that the consequences of the pandemic are still being felt, as the pandemic has not disappeared, but we have learned to live with it.

Keywords: *force majeure; contractual relationships; business enforcement; human rights; consumer interest.*

JEL Classification: A11, D5, K10, K12.

1. INTRODUCTION

The importance of the justifiable impediment, as well as the impact it can have on contractual relations, has been addressed over time, both in the field of law and in judicial practice, noting the evolution and improvement of the legislation in the field regarding the correct application of the institution of the justifying impediment, being a new notion that was implemented in the Civil Code of the Republic of Moldova starting from March 1, 2019, found in art. 904 Civil Code of the Republic of Moldova (Law no. 133/2019). The content and features of the institution of justifying impediment are similar to those of force majeure, an article found in the old regulation, however there are subtleties and ambiguities that we propose to develop in the present article.

The research also aims to clarify what circumstances or events could be considered a justifying impediment in a civil contract and whether the Covid-19 pandemic could fall into this category, as well as the applicability of the legal provisions in the context of the measures taken by the authorities in relation to the events that occurred once the pandemic stopped the entire economic circuit. Following a comparative analysis of national legislation and practices, as well as various opinions and considerations from the academic world, the research reveals under what circumstances during the pandemic period it was possible to invoke Article 904 of the Civil Code of the Republic of Moldova and what its peculiarities are.

We consider that this administration of justice is far from perfect, given the fact that the human factor is low and that it plays a role in decision-making, in this way the hypothesis is also admitted in all parties, but even the actors of justice do not apply and do not correctly understand the present the institution, this article being a novelty for the Civil Code. Also, the Covid-19 pandemic was so unpredictable, and it spread so quickly that society, especially the contracting parties, also encountered great difficulties during this difficult period.

Regulating, interpreting, and correctly applying legislation during the Covid-19 pandemic is highly important for the entire economic circuit, considering that through the enforcement of this provision, parties strengthen their trust in justice, being ensured the safety that in certain situations beyond their control, such as a global epidemic, they could be exempt from fulfilling contractual obligations if they are acting in good faith and if, due to the pandemic, they are genuinely unable to perform the contract.

The topicality of the subject stems from the devastating economic effects that the Covid-19 pandemic had on contractual relations, being particularly affected by the world of business, given the fact that businesses experienced interruptions in supply, and many contracts could no longer be executed or were executed, but improperly. The exact extent and number of businesses that suffered losses leading to bankruptcy followed by permanent liquidation from the market is not an exact one, but according to a survey conducted by the World Bank's

Development Economics (DEC), Business Analysis Unit, different approaches have been developed to measure the impact of the virus on the private sector and it has been concluded that at least 2 percent have stopped operating permanently, the majority of businesses being in the service sector (World Bank, 2020). Although it initially seemed to have started as a health crisis, its effects were very quickly felt in the economic field worldwide, being particularly affected in the field of tourism and that of restaurants, given the fact that for a while all restaurants have were closed, only home delivery being possible, in this context it is certain that the people employed in this field suffered, who were left temporarily without a job, the state and the companies being unable to cover the entire salary of the employees, thus from here a social crisis arose. Thus, even if we are in a post-pandemic period, where it seems that everything has returned to their places, we still consider that the consequences of the pandemic are felt to this day, given the fact that the pandemic has not disappeared, only we - the people we learned to live with it.

The general purpose of the article is determined by the unpredictability and the manner, as well as the speed with which the Covid-19 pandemic spread and how the particularities of the legal regime of the institution of justifying impediment are applicable in this case.

2. LITERATURE REVIEW

In the period 2020-2023 the notion, causes and effects of the pandemic have been quite discussed and analysed, as the consequences of the pandemic are still felt today. However, could the pandemic that has taken hold of all mankind be an excuse for not fulfilling a contract?! And if so, what would be the rule governing such a situation?! This situation has been established in the private law systems of other jurisdictions as an impediment beyond the control of the contracting party, such as "force majeure" (The Civil Code of the French Republic, 1804) in French law, "frustration of contract" in Anglo-American law, "höhere Gewalt" or "Unmöglichkeit" (The Civil Code of the Federal Republic of Germany, 1896) in German law, "непреодолимая сила" in Russian law (Amarița, 2006), however, somehow summing up to the same general idea, but with its peculiarities.

Given that the notion of force majeure is well known in Moldovan literature and there are a lot of studies and analyses of it, there were also legislative proposals to improve Article 606 of the Civil Code of the Republic of Moldova, which regulates force majeure. But in the modernized wording of the Civil Code in force since 1 March 2019 the notion has been replaced by the one in Article 904, namely "justification due to an impediment". So we will rely more on its analysis and the new peculiarities.

The institution given in art. 904 para. (1) The Civil Code of the Republic of Moldova regulates that "the debtor's non-execution of the obligation is justified if

it is due to an impediment beyond the debtor's control and if the debtor could not reasonably be asked to avoid or overcome the impediment or its consequences".

Thus, considering the definition given by the Civil Code, we come to the idea that: for an event to be considered a justifying impediment, it must meet the following conditions:

- an event outside the debtor's control occurs,
- the debtor could not reasonably be required to avoid or overcome the impediment or its consequences;
- be exceptional.

The COVID-19 pandemic certainly corresponds to conditions one and two from the list presented above. At the same time, regarding its exceptionality and the possibilities to foresee its occurrence, the parties to a contract may have different opinions. Thus, the creditor can claim that in the last two decades there have been several global epidemics (atypical pneumonia, ebola, swine flu), which lack the exceptional character of the coronavirus. Moreover, entrepreneurial activity expressly assumes the existence of risk in this activity, but on the other hand the debtor can claim that the consequences of the coronavirus differ so significantly from those of previous pandemics that the current virus could not be predicted (Tarîța, 2021). Thus, in our opinion, the Covid-19 pandemic could certainly be considered a justifying impediment, given its proportions and consequences.

3. DATA AND METHODOLOGY

Regarding the methodology used in the process of writing the scientific article, efforts were made to suggestively elucidate the essential aspects of the impact of the pandemic on contractual relations and the functionality of contracts in commercial practice, this aspect would facilitate the need to understand the respective issue. In this sense, the following methods were used:

- the comparative method, which helped to expose the differences in the legislation of the Republic of Moldova and the regulations during the pandemic at the national level, compared to that of other states, which also went through the consequences of the pandemic;
- the systemic method, in which the problem of applying contracts in practice during the pandemic period was highlighted and analyzed;
- the statistical method that was applied to be able to highlight the number of companies, but also the actual contracts that they had to lose as a result of the pandemic;
- the logical method helped us to clearly formulate the conclusions related to the investigated field, the ways of interpreting the legal norms and a complex study of the legal practice. Several electronically provided articles were also used in the study, as information relevant to the

pandemic period regarding force majeure was limited in books and journal articles.

This research also aims to analyse the impact that the pandemic has had on human rights, in particular how companies have assumed certain obligations to guarantee certain rights, both to consumers and to their own employees, who have found themselves facing forced unemployment.

The United Nations Guiding Principles (UNGPs) on Business and Human Rights do not explicitly mention specific rights, such as the right to health or the responsibility of companies in emergency or other crisis situations. However, as a whole, the UNDP clearly requires companies to: be diligent and assess the impact of their activities and behaviour on all rights, including the right to health. Companies must take all possible measures to mitigate potential harm, ensure that their conduct does not cause or contribute to harm, address risks identified as serious, and enable the realisation of all rights, including the right to health.

4. OVERCOMING THE PANDEMIC CRISIS IN THE REPUBLIC OF MOLDOVA

In practice, in the Republic of Moldova, things were a little different, given the fact that, according to the provisions of art. 4 para. (2) lit. g) from the Law on the Chamber of Commerce and Industry no. 393/1999: the attributions of establishing and confirming force majeure events in the relations between the subjects of entrepreneurial activity rest with the Chamber of Commerce and Industry. The current pandemic, however, highlighted the discrepancy between the provisions of various legislative acts regarding the issuance of certificates confirming force majeure.

Thus, through the Law on the modernization of the Civil Code and the modification of some legislative acts no. 133/2018, entered into force on March 1, 2019, the concept of "force majeure" was replaced by the concept of "justification due to an impediment". Despite the fact that the "old" norm, which regulates force majeure, and the "new" norm, which regulates justification due to an impediment, are based on the same hypothesis and provide for the same circumstances, the Chamber of Commerce and Industry refused to issue such certificates. The reason cited is that similar changes were not made in the Law of the Chamber of Commerce and Industry (Augenblick and Rousseau, 2012). Thus, if the notion of force majeure de jure does not exist, on 18.03.2020, the Chamber of Commerce and Industry notified the Parliament about the suspension of the issuance of the mentioned certificates. Given that several problems related to the proof of non-execution of contracts arose, art.4 of Law no. 393/1999 was subsequently amended in such a way that the Chamber of Commerce could resume issuing certificates starting from October 2020, when they were voted the legislative changes that are also valid for the mentioned law.

In the context of the aforementioned, it is important to note that non-performance is not justified if the debtor could reasonably have taken into account the impediment at the time of conclusion, if the obligation arose from a contract or other legal act. So the question arises: contracts concluded after March 17, 2020, can they still invoke the justifying impediment? Given that the seriousness of the situation was already known and the state's economic situation began to become precarious, most of the agreement areas were closed, the only ones operating normally being the grocery stores and pharmacies. So in that case, we consider that in the contracts concluded after March 17, 2020, the parties can no longer invoke the justifying impediment as a reason for non-execution or improper execution.

4.1. The effects of the pandemic times on consumers interests

With the declaration of the state of emergency in the context of the Covid-19 pandemic, both in the Republic of Moldova and abroad, each person as a consumer went through a series of changes in terms of their behavior and primary needs during this period. The restrictive measures that were imposed during the consumer pandemic, primarily by limiting physical interaction, caused an unprecedented economic crisis.

Thus there was an imposing drop in demand and supply on the market, changing the entire economic circuit in general, the main pandemic effects on human rights being identified primarily in general, as follows: The right to health, Freedom of movement, Workers' Rights (Fair, 2022).

A major trend among consumers was to reduce budgets for non-essential expenses, which soon became a permanent one for about a quarter of them, given that we did not manage to fully recover from the crisis caused by Covid-19, as we immediately entered an energy and economic crisis caused by the war in Ukraine, thus a large part of consumers have not returned to the usual consumption of the pre-covid period.

According to disaster psychology, the different psychological changes of residents caused by different emergency periods make purchasing behaviors exhibit distinctive characteristics, such as panic buying behaviors, impulse buying behaviors, compulsive buying behaviors, and online purchasing behaviors (Tao and Sun, 2022)

Another approach considers that some of the behaviors induced by COVID-19 that have been studied include consumption changes, which in addition to impulse buying and hoarding and panic buying, also include product and brand substitution and changes in channel preferences. Adaptations in people's purchasing behavior due to COVID-19 are consistent with existing literature that encompasses changes in consumer needs and preferences induced by environmental, social, biological, cognitive, and behavioral events (Das, Sarkar and Debroy, 2021). So some products that did not enjoy much demand on the

market, such as: masks, disposable gloves, antiseptics, which simply became indispensable to everyone, health being a priority for consumers, but also the legal norms required citizens to always be equipped as safely as possible, entry into closed spaces being prohibited without a mask.

Once safety and health became a priority, consumer purchasing patterns and preferences also changed quite rapidly. The pandemic has reshaped life as we know it now and accelerated several trends. One of the biggest of these trends is e-commerce. The increase in orders and home deliveries has led to unprecedented growth in online shopping. According to new data presented by IBM, the pandemic has accelerated the shift of consumers to e-commerce by five years.

Considering the fact that the pandemic has led to a rapid increase in consumer confidence in online shopping, and many companies have changed their business and invested more and more in this alternative way of buying, we still need to emphasize the importance of knowing your rights and consumer obligations in the online environment, as well as guaranteeing safety in this uncertain stage (Plotnic and Popescu, 2022).

The legal nature of the adhesion contract under the risk of contractual imbalance from the perspective of national and European legislation, proved to be a source of post-pandemic effects on the economic interests of consumers. Most of the time, the consumer concludes a contract without being able to discuss the content of the latter. Under these circumstances, one is tempted to say that freedom of contract is somewhat impaired even if the consumer remains free to contract or not. The risk is that an agreement containing clauses drawn up by a professional will be imposed on the consumer and these clauses can be the source of a contractual imbalance (Plotnic and Marian, 2020).

At this stage, it is legitimate to ask about the reasons for this imbalance. It appears that these reasons are primarily practical reasons that, under the guise of controlling counterparty risks, lead to a positional advantage. In classical contract theory, contractual equilibrium was the result of negotiation leading to a convergence between the opposing desires of the parties leading to consent. Regarding the price in particular, it was the haggling that allowed the balance on this price.

Within the European Community, the consumer is sufficiently protected by contract law both in the online and traditional environments. This protection is based, first of all, on private international law which guarantees, in most cases, the application of the legislation of the country of habitual residence of the consumer, also vis-à-vis third countries. Secondly, the E-Commerce Directive introduces a series of obligations for the service provider at the conclusion of the contract: that of providing certain information, that of confirming receipt of the order without undue delay and by electronic means, and finally, that of to provide the recipient of the service with adequate, efficient and accessible technical means that allow them to identify errors made when entering data and correct them before

placing an order. Thirdly, we should not forget the special protection offered to consumers by the Distance Contracts Directive (Plotnic and Praporscic, 2020). Thus we can conclude that even in the context of recent events, which depended on consumers and were absolutely unpredictable, the consumer is protected and his rights are safe.

4.2. The effects of the pandemic times on business environment

Business and life in general has always been full of uncertainties and risks. For decades, upheavals, disruptions and new global trends such as digitisation, technological transformation, geopolitical shifts, changing business models and shifting consensus around globalisation and trade have never ceased to disrupt the very notion of decision-making and business development.

However, the COVID-19 pandemic is changing, if it has not already changed, our collective understanding of uncertainty, as there is no event comparable to the COVID-19 crisis in the last century. We have had flu epidemics. We've had "Black Monday" and the 2008 financial crisis, and we've had localized threats and disasters that had regional or national consequences: Chernobyl, Iraq's invasion of Kuwait, the September 11, 2001 attacks (Jackson, 2021), Hurricane Katrina, etc. But the COVID-19 pandemic is unique: it is a truly global crisis and has deeper and more complex consequences and ramifications than any other crisis humanity has seen or experienced.

The Covid-19 pandemic had a very marked impact on the financial situation of companies around the world: they experienced a sudden drop in turnover, unprecedented in certain sectors, they had to reduce their taxes and borrow to -he respects his deadlines. At the same time, they enjoyed support from the state (Bauer, Hadjibeyli and Roulleau, 2021).

In order to position themselves correctly in the market in front of consumers, companies must first analyze how the pandemic period has influenced consumer preferences and then design their sales and marketing strategies in such a way as to meet customer preferences. At the same time, however, they must also pay attention to the tax implications arising in the process of product promotion. Both globally and in the Republic of Moldova, the priority of consumer goods producers is adapting to the changes that have recently occurred in consumer preferences. From the perspective of distribution channels, more and more companies believe that they need to continue the migration to online and ensure a pleasant experience in this environment as well compared to other sales channels. Many of the players who before the pandemic gave little importance to the development of this sales channel have allocated significant resources to match their competitors who started earlier (Malahov, 2021).

Thus, if there were no digital ways of doing business, most companies would have been paralyzed during the crisis. So, it is not surprising that entrepreneurs are currently planning to invest more in such enabling technologies as the cloud,

the Internet of Things, artificial intelligence and electronic payments, with most businesses increasing their budgets in this regard. The pandemic has moved everyday life, shopping and work online – not just for younger consumers, but for older people as well. It has also placed greater value on safe and durable products, a trend that most companies believe will continue in the near future. At the same time, the crisis has spurred demand for better product information and increased expectations of quick delivery.

The private sector in the Republic of Moldova was much more affected by the pandemic than in European countries in the same period, considering the fact that our country is a developing country, with an unstable economy, which was certainly not prepared for such challenge like the crisis caused by Covid-19.

On average, about 2 percent of Moldovan companies ceased their activity, which is half of the average reported in 37 other countries (Akhalkatsi, Jolevski and Rovo, 2021). where a survey was conducted similar. The industrial sector was less affected than the services sector. On the other hand, the labor market suffered significantly. The initial shock resulted in job losses of about 23 percent in May compared to the level recorded in January 2020. Although private sector employment subsequently experienced a moderate recovery, employment remained more than 10 percent below pre-crisis levels in November. Access to finance has become increasingly difficult for the private sector and, again, small companies - with cash shortages - faced the biggest challenges. According to data for November 2020, about 20 percent of surviving companies have applied for a loan since the outbreak of COVID-19, and over a third of these requests were rejected. Refusals were registered especially for small and medium-sized companies – about half of the applicants did not qualify for a loan.

Micro, small and medium-sized enterprises (SMEs) represent 71% of added value and employ 60% of the labor force in the economy of the Republic of Moldova, mainly in retail and wholesale trade, agriculture, manufacturing and construction. Most MSMEs have reported sales declines of up to 75-100 percent. Companies have experienced a decrease in demand for products and services, restrictions on their activities and disruption of supply (especially for imported materials). Companies expect to mitigate these challenges by reducing personnel costs (83%), reducing administrative expenses (75%), deferring strategic investments (83%) and reducing production (75%) (UNDP, 2021).

5. CONCLUSIONS

The COVID-19 pandemic has significantly affected the economic development of countries around the world, but it has also deepened existing problems. Consequently, the effects of the pandemic increased on the one hand, the need for economic transformation, modernization and qualitative development and on the other hand launched new technological reforms that led to the emergence of economic forms of business models, consumption, as well as

policies at the state or local government level. The effects of the pandemic are still visible in many aspects of life, including economic activity and the individual decisions of economic subjects at the level of households, businesses and governments.

With the online revolution enabled during the pandemic, the economic imbalance between the parties led to a disproportion that prohibited negotiations. Jurisprudence sought to avoid a too pronounced imbalance in accession contracts, especially through the inapplicability of onerous clauses, contrary to fundamental obligations, and especially of clauses limiting or excluding liability. On the other hand, it does not bring back a total possibility of negotiation, as it is limited by the requirements that tend towards the equality of the contractual conditions.

The contribution of this article can therefore be the identification and quantification of the aspects of the protection of human rights (consumers) and of the business environment in the Republic of Moldova, but also in the whole world, which have been affected by the pandemic. This can help focus the right measures, serving to mitigate the immediate but also long-term consequences of a future pandemic or force majeure within the confines of the national regulatory framework.

While companies will undoubtedly become more digital, they will also become more socially responsible as they strive to meet changing attitudes and the growing desire of customers and employees for a healthier and safer world. On the other hand, consumers are much more confident and informed, the pandemic making them increase their trust in the online environment, the regulation being one in some places laconic, especially in the Republic of Moldova, but the new rectifications make us believe that consumers in the post-covid are safe and much more prepared for a force majeure event than the 2020 pandemic found us.

We believe that more effective policies are needed to support companies during the recovery period and strengthen their resistance in the future, given the fact that the Republic of Moldova did not manage to recover from the Covid-19 crisis, as it was immediately influenced by the war in the neighboring country, which led the private sector into new uncertainty.

ACKNOWLEDGMENTS

The authors acknowledge the co-financed support by the European Commission, European Education and Culture Executive Agency (EACEA), Chair Jean Monnet on EU Studies for Human Rights Protection and Alternative Dispute Resolution, Grant Agreement number: 101085276 — EU4JUST — ERASMUS-JMO-2022-HEI-TCH-RSCH. Views and opinions expressed are however those of the authors only and do not necessarily reflect those of European Union or European Commission (EACEA). Neither the European Union nor the granting authority can be held responsible for them.

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SOURCES AND RESOURCES FOR FUNDING SPORT IN EUROPE

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Abstract

Direct or indirect public funding of sports activities is a reality in all European countries, except that political and legal funding models differ according to culture and civilisation, sports tradition and sports practitioners, mentalities and financial power. Private funding of sport or self-financing of sport is complementary to public funding and must ensure, in particular through revenue from games, betting and lotteries, revenue from the exploitation of property rights in sporting events and competitions, revenue from intellectual property rights, revenue from the issue and sale of securities, revenue from sponsorship, revenue from the transfer of professional athletes, adequate and sufficient funding for the development and support of sporting competitions and participation in sporting competitions. Contemporary sport is a complex machine that is constantly fed with considerable amounts of money in order to function and produce competitive performance. Without funding, sport cannot be competitive, it cannot achieve its specific goals in a world where the profit motive is irresistible.

Keynotes: *public funding; private funding; revenue; sport; sport competitions.*

JEL Classification: Z23, K30.

1. FINANCIAL BACKGROUND

The budget is the modern instrument of state intervention in economic and social activities. The transfer of resources from public funds to the various beneficiaries increases their cash resources, increasing the possibilities for development and consumption. The national public budget plays a particularly important role in the complex process of distributing and redistributing net social product in the national economy and between the state and the population (Costaş and Tofan, 2023).

Financial control of the state is wide-ranging, covering all areas of social and economic life that are linked to the public sector: from economic and military life to education, health and sport.

Public funding of sports activities is a reality in most countries of the world, with different political and legal models depending on culture, level of civilisation, mentality and financial power. The regulatory framework divides powers to finance sport between the state and the territorial administrative units.

The idea of financing sport has multiple connotations involving: financing sports clubs, financing sports competitions, financing sports events, financing athletes, financing other participants in sports competitions (e.g. coaches).

European doctrine has shown that developments in recent decades - the transformation of top-level sport to adapt to the market economy, the increased media coverage of competitions, the commercialisation of sporting events, the professionalisation of athletes - have contributed to changing the structure of financial flows in sport. It has been noted in this context that there is a double divide in practice:

- between professional and amateur sport, on the one hand;
- between football, the main beneficiary of private funding, and other sports, on the other hand (Buy, Marmayou and Porrachia, 2020).

From the point of view of EU law, it has never seemed sufficiently concerned to confer effective powers on the European institutions in the field of sport, even though sport was brought to the fore in European policies alongside other areas such as 'education' or 'youth'. Today, the content of Article 165 of the Treaty on the Functioning of the European Union reveals the intention to create bridges between two fundamentally different structures: the sports movement and the European Union. The regulation betrays this desire, except that the institutional approach is relatively complicated, partly because, geographically and politically, the European Union currently comprises 27 Member States, while the European Football Union (UEFA) comprises 53 Member States.

Are affiliated to UEFA, in addition to the Member States of the European Union: Albania, Andorra, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bosnia and Herzegovina, Faroe Islands, Northern Ireland, Georgia, Gibraltar, Iceland, Israel, Kazakhstan, Kosovo, Liechtenstein, North Macedonia, Moldova, Montenegro, Norway, Russia, San Marino, Scotland, Serbia, Switzerland, Turkey, Wales, Ukraine. Some of these countries are not even geographically located in Europe, but are nevertheless accepted by UEFA in competitions organized under its aegis (Put and Coştaş, 2021).

2. PUBLIC FUNDING OF SPORT

If at the time of the emergence of modern sports and the first associative structures in the mid-19th century, the financial dimension was completely neglected in the context of the existing sports frenzy, in today's world, public funding of sport is a reality, a certainty and a necessity, because grassroots sport, as opposed to performance sport, cannot obtain sufficient resources from private funding. In contrast to the American model, where sport is supported at national level, mainly in terms of infrastructure, and then developed systemically, on various levels, up to college level, from which it jumps to high performance, the main objective of which is to maximise profits, the European model is a syncretic one, different for each individual country. It has been pointed out in doctrine that

the originality of the American model was to implement instruments to regulate economic competition between clubs so as not to compromise sporting competition. The European model, unlike the American model, has long been dominated by the primacy of the sporting objective (ranking) over the economic outcome, but the situation is more complex. While the mechanism of participation in certain competitions always depends on the sporting ranking, the latter is increasingly linked to the financial capacity of clubs. The question is whether this increase in financial criteria will not lead to the emergence of a system similar to the model across the Atlantic (Bourg and Gouguet, 2005). The question is not just rhetorical, because beyond the purely sporting objective, the mercantile objective is increasingly present, especially in strong European football competitions.

Public financing of sport does not imply the identification of sports associations or clubs with the state or its offshoots, state institutions, because sports teams owned by public institutions will face numerous limitations due to their character as departmental teams, such as the impossibility of promoting to the elite echelon of a domestic competition or with the impossibility of participating in European competition.

In the first case, the much-debated case of the CSA Steaua Bucharest football team, which has no right to promotion to the Romanian Super League this season and is lobbying for a change in the sports rules, but does not call into question a change in the public "shareholding". In the second case, the pre-war debate about the football clubs Lokomotiv Moscow or Zenit St. Petersburg which were owned by Russian state companies at the time of their participation in competitions under the auspices of UEFA.

The main ways of achieving public financing of sport are through: resources obtained through betting and gambling, resources obtained through taxes, fees or contributions, respectively budgetary allocations.

2.1. Resources obtained through betting and gambling

It is well known that states generally have a monopoly on the organisation of gambling, in the sense that the organisation and conduct of betting and gambling is in principle prohibited to private individuals, unless they are licensed to carry out an operator activity in the matter. The monopoly allows the States to lay down the rules for the conduct of gambling, *i.e.* the rules on financing and the destination of the sums collected.

In Romania, according to the provisions of GEO no. 77/2009 on the organization and operation of gambling published in OM no. 439 din 26 June 2009, as subsequently amended and supplemented, the organization and operation of gambling activity on the territory of Romania constitutes a state monopoly, the administration of the state monopoly being carried out by the National Gambling Office (art. 1 paragraph (1ind.1)). The State may grant the right to organize and

operate gambling activity on the basis of a gambling license for each type of activity and a gambling operating license for a limited period of time.

Therefore, European countries have agreed to channel part of the revenue collected from betting and gambling mainly towards the development of sports infrastructure and the support of Olympic sports and their representation at the Olympic Games. It has been pointed out in the doctrine that due to the limited nature of budgetary allocations, revenue from the operation of gambling is one of the ways of increasing funds for sport. Thus, from a historical perspective, England seems to have led the way in the 1990s when, against the backdrop of support for elite sports under the heading "winning medals are just as important as getting people to take part in sports", the National Lottery of England's resources supported amateur sport, Olympic sports and contributed to the development of sports infrastructure. Finland funds almost the entire sports sector through the national lottery (Veikkaus), while Germany allocates funds from this source to the German Olympic Committee (35%), the German Sport Aid Foundation (25%) and the regional sports confederations (40%), and the Netherlands funds sport through three entities: the Dutch Lottery, the Sponsor Bingo Lottery and the Lotto. Croatia provided 30-35% of its sport funding from this source, and Montenegro only 14%. In fact, as indicated at this stage, the funding of sport through betting and gambling revenues varies between 0.3 (Serbia) or 0.4 (Romania) euro/person/year and 26 euro/person/year (Denmark) (Rogic, Radonjic and Djuricic, 2018).

2.2. Resources raised through taxes, duties and contributions

In general, taxes or contributions are not allocated entirely or primarily to public funding of sport, as states have other priorities for spending public money. However, they represent important resources in the field, because sport is a social field with specific needs. We distinguish sport in this context from physical education and its didactic specificity.

This category may include tax levies on the income of agencies or companies operating gambling, fees and contributions associated with sporting events, value added tax on admission tickets to sporting events (a tax which, for example, France only applied under pressure from the European Commission from 1 January 2015) and so on. For example, in France, the National Sports Agency collects around 1.8% of the annual revenue of Française des jeux, with a maximum ceiling set by law. Regarding the contribution, this may include the contribution for the transfer to a television service of broadcasting rights to sporting events and competitions, governed by Article 302 bis ZE of the French Tax Code, amounting to 5% of the value of receipts. In Romania, a reduced VAT rate of 5% is applied to services consisting of allowing access to sporting events (Article 291(3)(b) of the Tax Code) and to the right of use of sports facilities whose activities fall under CAEN codes 9311 and 9313 (Article 291(3)(f) of the

Tax Code). However, it should be noted that according to Art. 292 para. (1) lit. l) C. fisc. VAT is exempt for the supply of services closely linked to the practice of sport or physical education, carried out by non-profit organizations for persons practicing sport or physical education.

In Romania it was established by Law No 3/1992 Published in OM no. 10 from 31 January 1992 the Olympic stamp which had a value of 500 ROL and was applied to every ticket sold at any sporting event in the country and was included in the ticket sale price. Today, according to Article 75 (b) of Law No 69/2000 on Physical Education and Sport Published in M. Of. nr. 200 from 9 May 2000, the Olympic stamp is 10% of the value of all access tickets to sports events, and failure to pay the Olympic stamp to the COSR constitutes a contravention, governed by Article 88 (i) of the Law.

At the same time, in Romania, local authorities levy the entertainment tax, regulated by Articles 480 - 483 of the Tax Code, which in the case of sporting events is 2% of the ticket price and must be paid to the local budget by the 10th of the month following the month in which the sporting event or competition took place (Costaş and Puț, 2023).

2.3. Resources obtained through budgetary allocations

Funding sport through national, regional or local public budget allocations is a reality for most countries. For example, according to a Eurostat release of 23 September 2020, in 2018 the 27 EU Member States used the EUR 50.7 billion to finance the "recreation and sport" category of expenditure (a relatively stable proportion of total public expenditure since 2001). Some of the figures presented are relevant:

- Bulgaria (€11/inhabitant/year), Romania (€30) and Slovakia (€31) allocate the least resources to this area, far behind the EU-27 average (€13) and the top three countries in the ranking (Luxembourg - €500, Sweden - €254, Finland - €226).
- As a proportion of total public expenditure, Bulgaria, Ireland and Malta account for a total of 0.4% of total expenditure on recreation and sport, while Hungary supports the field with 2.1% of total public expenditure.

Relatively recently, at European Union level, European Council Resolution 2020/C 419/01 adopted the so-called European Union Work Plan for Sport (1 January 2021 - 30 June 2024) Published in J.O.U.E. C 419/1 from 4 Dec. 2020. From a public funding perspective, the actions envisaged by the Union will be considered in the context of sport's contribution to regional development, with the possibility of using European funding programmes (Recovery and Resilience Facility, React-EU, Structural Funds).

For example, in France, amateur sport and high-level sport are funded by both the National Agency for Sport and the local authorities. In this respect, according to Article L.112-16 of the Sports Code, the Agency concludes with the

French State a "convention of objectives" for a period of 3 to 5 years with clear elements: determination of the actions within the framework of public sports policy which are entrusted to the Agency; setting of the Agency's objectives; determination of the public resources made available to the Agency within this multiannual framework. These resources come mainly from the tax levies assigned to the Agency - part of the revenue generated by the Française des Jeux company, the sums staked on sports betting and the revenue from the transfer of audiovisual rights to sporting events and competitions. The sums available to the Agency are allocated to approved sports federations, regional conferences, territorial authorities or other public bodies involved in sport, on the same model. Local and regional authorities also contribute to supporting amateur and top-level sport through direct aid (grants and, in exceptional cases justified by a local public interest, loans) and indirect aid (loan guarantees, provision of public sports equipment, provision of public agents). In the specific context of public funding mechanisms, which is not only the case in France, indirect aid must also be taken into account, which can take the form of the provision of sports infrastructure, tax amnesty for the tax liabilities of sports structures or sportsmen and sportswomen, the guarantee of loans for national or local sport or the provision of free or privileged services to sports structures.

As far as professional sport is concerned, it can attract funds under grant agreements, provided that they comply with European competition rules, strictly to support the training of athletes, the fight against violence, educational, integration and social cohesion actions. On the other hand, local and regional authorities can conclude service agreements with professional clubs whereby they can either buy advertising space in sports arenas or purchase tickets for sports events organised by the professional club and distribute them locally (e.g. to local schoolchildren).

There have been several "Spanish" cases in which European courts have censured subsidies granted: General Court EU, from 26 february 2019, case T-679/16, *Athletic Club Bilbao v. European Commission*, ECLI:EU:T:2019:112; Tribunal UE from 20 march 2019, case T-766/16, *Hércules Alicante v. European Commission*, ECLI:EU:T:2019:173; Tribunalul UE, case from 22 may 2019, case T-791/16, *Real Madrid v. European Commission* ECLI:EU:T:2019:346. Instead, European courts have validated public aid granted in the Czech Republic to non-profit organisations for the construction and operation of sports facilities (Tribunal UE, case from 12 may 2016, case T-693/14, *Hamr-Sport a.s. v. European Commission*, ECLI:EU:T:2016:292) or subsidies granted in Germany for the construction and operation of climbing centres (Tribunal UE, case from 9 june 2016, case T-162/13, *Magic Mountain Kletterhallen GmbH and others v. European Commission*, ECLI:EU:T:2016:341).

2.4. About public funding of sport in Romania

Title IX of Law No 69/2000 regulates „Financing of sports activities”. According to the provisions of Art. 69 para. (1), non-profit sports structures and the Romanian Olympic and Sports Committee may benefit from occasional allocations from the state budget and local budgets, depending on the availability of public budgets and under the conditions set by the public authorities, to finance sports programmes, under the conditions described in the following section to reflect the latest legislative changes. In addition, in accordance with the general provisions of Article 69 (2) of the Treaty, the Commission shall take the necessary steps to ensure that the general provisions of Article 69 (2) of the Treaty are complied with. (4) of Law No 69/2000, public law sports structures may also benefit from other (public) sources of income, namely income from the exploitation of assets in their patrimony.

For the purposes of Article 70 para. (1) of the law, the Ministry of Youth and Sport finances its activity through annual allocations from the state budget and local budgets, respectively revenues from the proceeds of the National Company "Romanian Lottery" SA. Unlike occasional allocations, on a project basis, annual budget allocations are in principle fixed and are determined by the institution's budget, approved under the law. In addition, according to Art. 44 lit. c) of the Implementing Regulation (2001), the Ministry must also benefit from a 1% levy on national taxes and excise duties on cigarettes and alcoholic beverages.

The county youth and sport directorates and the Bucharest municipality are publicly funded from the following sources [Art. 70 (2) of Law No 69/2000]:

- annual budget allocations;
- a 30% share of the tax on sports events held in the respective county (according to Article 50 of the Regulation, this share is payable monthly by natural and legal persons organising sports events for a fee, by the 15th of the following month);
- income obtained from the revaluation of their assets.

According to Article 71 of the law, national sports federations may benefit, in addition to budgetary and project allocations, from the income from the exploitation of assets in their patrimony. At the same time, sports clubs are financed by [Article 71 (2) of Law No 69/2000]: subsidies from the State budget and local budgets granted to sports clubs governed by public law by the central and/or local public administration bodies under which they operate and by the local public administration bodies of the administrative-territorial unit concerned; revenue from the exploitation of assets belonging to them.

The Romanian Olympic and Sports Committee benefits, according to art. 75 of Law no. 69/2000, besides budgetary allocations, from other sources of public funds: the Olympic stamp (10% of the value of all access tickets to sports events); revenues from the proceeds of the National Company "Romanian Lottery" SA; revenues from the organization and operation of sports betting and betting. It

should be noted that, according to Article 47 of the Regulation, the Ministry of Youth and Sport transfers monthly to the COSR account, by the 5th of the following month, a share of 25% of the revenue it collects by way of 1% levy on taxes and excise duties applied at national level for cigarettes and alcoholic beverages.

As I pointed out on another occasion, in terms of local public funding of sport, both in law and in practice, until 2017 in Romania there was only disagreement, because there were no legal provisions regulating this hypothesis (Puț, 2018).

Today, the financing of sports clubs can be carried out by local or county administrative-territorial units without being limited by any regulatory ceiling, because by Law 90/2018 Published in M. Of. no. 335 from 17 april 2018 for the approval of Government Emergency Ordinance No 38/2017 on amending and supplementing the Law on Physical Education and Sport No 69/2000, the cap on sports funding of up to 5% by local public authorities introduced in 2017 has been waived. For example, in Hungary they have opted to prioritise public investment in sport. This is because a programme has been adopted to fund five sports of national interest - swimming, polo, football, handball and basketball - with a basically unlimited budget. The remaining federations receive reduced public funding gradually, with the federations being divided by category by regulation. The main sources of funding are direct subsidies allocated to sport in the budget.

The sports entity seeking funding submits an application for funding for one of the sports programmes and if its application is declared eligible will conclude a funding contract with the funding public entity.

3. PRIVATE FUNDING OF SPORT

Private funding of European sport should be the most important resource of modern sport and is predominantly generated from: income from gambling, betting and lotteries, income from the exploitation of property rights in sports events and competitions, income from intellectual property rights, income from the issue and sale of securities, income from sponsorship, income from the transfer of professional athletes. In this paradigm, the relationship between five components must be taken into account: assets, liability, capital, income and expenditure (Stewart, 2017). Despite being formalised and organised as sports associations, sports structures must draw up a financial-accounting plan showing the relationship between income and expenditure in order to ensure the financial coherence necessary for the smooth running of the activity. Apart from public funding, which depends on external factors such as political colour or doctrine, the size of the state budget and the coexistence of investment projects, private funding sources must be sufficiently well configured to ensure that the current expenditure of sports associations or clubs is covered.

3.1. Gambling, betting and lottery resources

In some jurisdictions, private funding of sport can also be provided through gaming, betting and lottery revenues, to the extent that these are organised directly by sports federations, professional leagues or other organisers of sporting events. For example, it has been pointed out in French doctrine that, following the Law of 12 May 2010 liberalising the organisation of online sports betting, the organisers of sporting events in France have been given the possibility of exploiting financially the right to organise online betting in the context of these events and thus obtain financial resources. Also (Buy, Marmayou and Porrachia, 2020) confirm that we are dealing with an extremely strict regulation, which poses problems also from the point of view of ethical rules, so as to minimise the risk of manipulation of sports competitions

3.2. Resources accruing from the exploitation of property rights in sporting events and competitions

The exploitation of the sport specificity and of sport competitions and the ownership of them is a major source of funding for sport, especially as it involves revenue from:

- sale of tickets and season tickets (physically or online);
- assignment of audiovisual rights;
- *merchandising*. In fact, the marketing of various promotional items (customised pieces of sports equipment, balls, etc.) generates significant revenues for the big sports clubs that associate their image with newly transferred athletes or team stars.
- allowing visitors access to the museum and club facilities. Admission fees are charged for visiting the trophy museum and the Santiago Bernabeu stadium (stands and reserve bench area) in Madrid.
- marketing of photographs, phonograms, objects of athletes, books dedicated to sporting events (e.g. balls used during tennis tournaments);
- allowing access to selected suppliers inside the arena (e.g. food and beverage retailers, home team sports equipment retailers), etc.

3.3. Resources from intellectual property rights

The benefits of exploiting intellectual property rights are important in the world of sport. Attempts to brand sporting events are ubiquitous. Under the conditions laid down in the specific legislation of each country or under the conditions laid down in European legislation, recognition of the trademark and its protection for a certain period of time is obtained. Ensuring legal protection entitles the trademark owner to take legal action against any person who infringes his exclusive rights and also to monetise his right. Perhaps the most eloquent example is the International Olympic Committee and the national Olympic committees, which are the owners of the Olympic emblems and other elements

likely to be associated with the Olympic Games (motto, anthem, Olympic symbol, etc.). Other distinctive signs such as the trade name and the emblem also benefit from protection.

3.4. Resources from issue and sale of securities

As professional sports clubs gain economic strength associated with sports performance, they also become interested in listing on the stock exchange (Buy, Marmayou and Porrachia, 2020). Thus, it is well known that the major players in sport make revenues from three major components: commercial (sponsorship and retail activities, merchandising, sale of sports products and equipment, licensing of club-branded products); television rights (transfer of audiovisual rights); sports competitions (*e.g.* some clubs sell tens of thousands of tickets for each match and have a 10-year waiting list for available boxes, which are reserved for longer periods of time). Therefore, in order to grow further and make a significant profit, these clubs choose to make themselves accessible to investors. For example, there are currently several listed football clubs, such as Manchester United (market value \$2.4 billion), Juventus Torino (€1.2 billion), Borussia Dortmund (€25 million) or Ajax Amsterdam (€281 million).

3.5. Sponsorship resources

The Sport is a universal social phenomenon. The specificity of competition, the desire for success, the unique intimate thrill of winning a competition attract a multitude of sponsors who want to be in the best seats in the stadiums and as close as possible to the main players who are the athletes. Signing a sponsorship contract makes it easier for them to achieve these goals, in return for money. Sponsorships are directed either to *specific athletes*, either to *certain clubs*, but also to sports federations or professional leagues (professional leagues have been known to adopt the names of sponsors for their own competitions - *e.g.* Superleague).

Regarding an example where sponsorships are directed to *specific athletes*, we have in mind the footballer player Cristiano Ronaldo's list of sponsors which includes Nike, Herbalife, EA Sports and Tag Heuer, while tennis player Roger Federer has income from Uniqlo, Nike, Wilson, Credit Suisse, Mercedes, Rolex, Lindt, Jura, Moët & Chandon, Sunrise and NetJets etc.

When we talk about a *certain club*, in 2022, the list of major sponsors in world football included Real Madrid (Emirates, \$413 million from 2017 to 2022), Tottenham Hotspurs (AIA, \$400 million from 2019 to 2027), Manchester United (Team Viewer), Barcelona (Rakuten), Bayern Munich (T-Mobile), Arsenal London (Emirates), Liverpool (Standard Chartered).

3.6. Resources obtained from the transfer of professional athletes

It has been shown (Buy, Marmayou and Porrachia, 2020) that the first transfers took place in England from 1888 to satisfy three objectives at Football

League level: to organise a competition between professional clubs; to set a salary cap for players; and to impose an obligation on both players and clubs to obtain League authorisation for any transfer to a new club. Of course, over time, the field of transfers has evolved significantly and the Bosman case law has reduced the number of sports transfers. Today, transfers are, as a general rule, absent from individual sports (athletics, golf, tennis) and genuine events in certain team sports. The excitement associated with the close of a market period (when transfers are allowed) is akin to that of a political election or stock market atmosphere, with suspense, bidding, extensive media coverage, social media interest, coups d'etat and so on.

They are, however, a very important source of revenue, especially for smaller clubs, for whom a transfer of their own player to a top club can be a godsend. In European football, as a rule, clubs from Eastern Europe: Serbia, Ukraine, Hungary, Romania, also support and develop themselves through transfers to Europe's strong championships. It is enough to recall the transfer of Mykhailo Mudrik from Shakhtar Donetsk to Chelsea London in 2023 for 100 million euros.

3.7. About private sources of funding sport in Romania

According to the provisions of Law No 69/2000, the sources of private funding are as follows:

- membership fees and contributions in cash or in kind from supporters;
- donations and legacies, in cash or in kind;
- income from advertising and publicity;
- income from the sale of tickets and season tickets for sporting events and competitions;
- allowances from participation in sports competitions and demonstrations;
- compensation obtained from the transfer of sportsmen and sportswomen [e.g. under Article 71 (1) (f) of Act No 69/2020, national sports federations are entitled to 10% of the domestic and international transfer fees of athletes, which constitute a source of funding for children's and youth sports activities, including school clubs];
- sponsorships;
- a 15% share of the market value of sports facilities that are disused or have changed their use, owned by private sports structures in the county concerned;
- income obtained from economic activities carried out in connection with the purpose and object of activity of the sports facilities management units;
- dues, fees, contributions, penalties applied by sports institutions (determined according to their statutes and regulations);

- a 5% share of the proceeds from the sale of entry tickets to official sports competitions organised by professional leagues (naturally, they collect this contribution for the events they sponsor);
- a 2% share of the revenue from contracts concluded by professional sports clubs for advertising, publicity and TV rights (the right to charge this percentage lies with the professional leagues);
- dues, contributions and penalties imposed on its members, athletes, coaches and other technicians by sports clubs, in accordance with their statutes and regulations;
- sums obtained from the transfer of athletes;
- contributions from the International Olympic Committee and Olympic Solidarity;
- income from the granting of the right to use the emblem of the Romanian Olympic Committee and other property rights (Puț and Coștaș, 2021).

4. CONCLUSIONS

European sport benefits from multiple sources of funding. However, without consistent public funding, without the creation of training, training and competition bases and without minimal tax incentives to encourage private investment, European sport will not be able to progress, and if we look at Eastern European sport, it will not be able to survive, because it will not be able to sustain the necessary expenditure solely from the private collection of revenue, especially if sports structures can only go as far as the anti-performance chamber. In addition to national, regional or local public funding, there are significant private funding models in operation that are designed to provide the majority of resources for sports associations and clubs to enable them to achieve great sporting performance. In summary, sport funding and sport performance are interdependent.

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EXPLORING THE CHALLENGES OF AGILE PROJECT MANAGEMENT IN SOFTWARE AND NON-SOFTWARE DEVELOPMENT CONTEXT

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Abstract

Agile project management (APM) has become increasingly popular among organizations due to the benefits it offers through the application of agile practices, principles, and values. These approaches are no longer limited to software project development. They are being applied in various fields such as education, human resources, research, healthcare, public relations, and production. By using an empirical approach, APM provides a significant level of adaptability that makes it suitable for a wide range of projects. Although agile values and practices are beneficial, their successful implementation depends on adapting them to the specific needs of the company, team, and project. In many cases, a hybrid project management framework that combines different approaches is preferred to create adaptive methods that cater to the specific needs of the project and project team. Nevertheless, the complexity and scale of projects can create more challenges to implementing agile practices. When selecting an agile framework, whether hybrid or not, it is essential to conduct a rigorous analysis that identifies the necessary adaptations and estimates the potential impact of those changes. This analysis is critical to ensure successful implementation and effective project management, aiming to complete projects within the established timeline and cost constraints while ensuring successful implementation and usage. The benefits of agile methodologies have been significant, particularly in software project development and other fields that require flexibility and adaptation. This study aims to enhance understanding of the challenges involved in APM, both in software development and non-software contexts.

Keywords: agile project management; challenge; software development; non-software context.

JEL Classification: O22, M15, O3.

1. INTRODUCTION

The popularity of agile methodologies has increased in recent decades due to the growing number of successful projects completed by companies that apply them, especially in the software development field. These methodologies were created as alternatives to traditional ones, promising to provide better quality results, faster, and with greater customer satisfaction.

Applying agile methodologies sometimes requires changes to the organization's strategy. While methods that apply agile principles offer a distinct perspective on project management, they are not suitable for every project or field of activity. In cases where they are considered the best option, choosing one of the agile methods can become a challenge. Adopting them can bring added value as they focus on project components considered most important by the client. In this context, many organizations have decided to embrace specific practices of agile methodologies favoured by the dynamic economic environment, easy communication, and early delivery of results in the project implementation.

The Agile Manifesto, published in 2001, serves as a reference point for the increasing popularity of agile methodologies (Beck *et al.*, 2001). Through this document, its initiators promote communication, collaboration, rapid delivery, and adaptability while discouraging bureaucratic processes and extensive documentation, thus stimulating the early release of the product. As a result, they provide visible results faster than traditional project management models because they are based on values and principles rather than processes that have longer execution times. Additionally, they offer support in adopting changes in a less costly manner than traditional project management models and methods.

However, the benefits of adopting agile methodologies are not limited to the outcomes. They include increasing the satisfaction level across the entire team, a sense of improved efficiency, increased autonomy, and a stronger sense of belonging (Laanti, Salo and Abrahamsson, 2011). The priority in agile project management (APM) is to ensure timely project delivery while incorporating all initial client requirements and any other requests that arise during the process. Numerous intermediate deliveries are made, and efforts are focused on shortening the development duration, contributing to the widespread acceptance of deliverables by clients.

The paper aims to identify the most significant challenges faced by teams that have adopted APM, both in software development and in other fields. The rest of the article is structured as follows. Section 2 presents a literature review on APM. In Section 3 the research methodology is described. Section 4 provides the main challenges of APM adoption and the results of the study. The last section presents some conclusions of the research.

2. LITERATURE REVIEW

The concept of agility in project management has multiple meanings. Highsmith (2004) describes it through the following five key objectives: continuous innovation, product adaptability, reduced delivery times, adaptability of people and processes, and reliable results. In 2016, Conforto *et al.* (2016) defined agility as “the project team's ability to quickly change the project plan as a response to customer or stakeholders needs, market or technology demands to achieve better project and product performance in an innovative and dynamic project environment”. In a study that combines systematic literature review and frame semantics methodology, aimed at clarifying the concept of agility in the context of project management, the same authors draw another interesting and relevant conclusion. They find that the active involvement of clients in the product development process, coupled with the team's ability to adapt and change the project plan, can significantly influence the performance of agility.

Agile methodologies include a series of frameworks explicitly developed for the software industry, such as Scrum (Schwaber and Beedle, 2001), eXtreme Programming (Beck, 1999), Lean Software Development (Poppendieck and Poppendieck, 2003), Dynamic Systems Development Method: The Method in Practice (Stapleton, 1997), Feature Driven Development (Palmer and Felsing, 2001). Initially, all models were designed for software development, but later they were extended to other fields of activity. Since 2011, the Project Management Institute (PMI) has launched a certification for practitioners using agile in software product development, named PMI Agile Certified Practitioner (PMI-ACP). This represented a significant milestone in recognizing the role of agile methodologies in the project management field.

Conforto *et al.* (2014) define APM as “an approach based on a set of principles, whose goal is to render the process of project management simpler, more flexible and iterative to achieve better performance (cost, time and quality), with less management effort and higher levels of innovation and added value for the customer”. The same authors consider agility as a team's ability rather than a characteristic of a methodology or practice. It enables team members to quickly adapt to changing customer requirements, market demands, or technological evolution. Cooper (2016) defines APM as “a microplanning or project management tool designed to engage a development team, including the customer, in getting to a working end product quickly”.

Several universally accepted characteristics differentiate the agile approach from traditional project management, regardless of the domain in which it is applied. These include flexible scope, incremental and iterative development of value-adding functionalities, adaptive planning, the presence of cross-functional self-organizing teams, and short iterations or continuous delivery (Serrador and Pinto, 2015; López-Alcarria, Olivares-Vicente and Poza-Vilches, 2019; Žužek *et al.*, 2020).

Over time, the agile approach has evolved from being specific to software development to becoming an innovative and versatile way of managing projects in various domains such as the food industry, marketing, construction, hardware development, research, education, and more. Organizations are now adopting it to enhance project and business performance (Goldstein and Euchner, 2017; Pellizzoni, Trabucchi and Buganza, 2019; Zasa, Patrucco and Pellizzoni, 2020). However, the use of agile methodologies is not a one-size-fits-all solution for all projects and domains of activity. Similar to other approaches, they pose numerous challenges and can lead to failure if the change is not preceded by an objective and detailed analysis of the context, or if the change occurs abruptly without preliminary testing.

3. RESEARCH METHODOLOGY

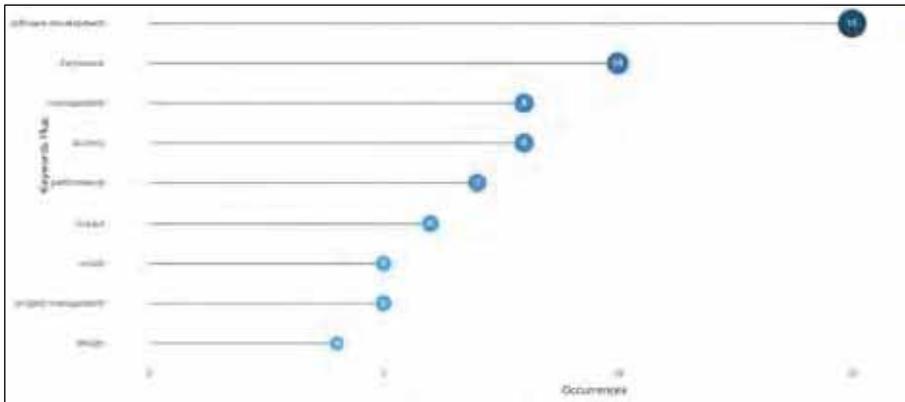
We conducted a literature review based on a well-defined plan and clear inclusion and exclusion criteria. We searched the ISI Web of Science database without limiting the time horizon to capture all the stages through which APM has evolved. The search term used was: '*agile project management*' AND (*challenge OR challenges*). The main research question is:

What challenges are experienced when using APM in software and non-software contexts?

We included only articles published in English and excluded editorial materials. Applying these criteria, we excluded 7 articles. Additionally, we removed one duplicate and a call for papers for a workshop. We obtained 98 results, including 47 articles (including two early access papers), 47 proceeding papers, 4 review articles, and 1 book chapter, published between 2005 and 2023. These results were then analysed using the Bibliometrix R package and the Biblioshiny web application.

4. RESULTS

This section analyses the main findings regarding the challenges of APM. The results obtained from data analysis with Bibliometrix reflect the fact that the challenges faced by teams and organizations choosing to adopt agile methodologies in project implementation are a significant concern among researchers (Figure 1).



Source: authors' representation

Figure 1. Most frequent word

As expected, the agile approach is predominantly associated with the software development domain. The main publishers of the extracted articles are IEEE (26 papers), Springer Nature (10 papers), Elsevier (9 papers), and Taylor & Francis (8 papers).

Within the extracted articles, the challenges of APM have been analysed from various perspectives, and they appear in the same cluster with critical success factors, scaling, leadership, decision-making, and the methods used by different teams and organizations (Figure 2). It is interesting to notice that the word 'success' appears in three out of four clusters.



Source: authors' representation

Figure 2. Co-occurrence Network

The challenges of APM are diverse, encompassing aspects related to the client relationship, team organization, requirements management, and more. Hoda and Murugesan (2016) analysed the challenges determined by team self-organization at four levels: project-level, team-level, individual, and task-level.

At the *project* level, these challenges are associated with changing requirements, which lead to difficulties in estimation, understanding the client's actual needs, and persuading managers to adopt agile methods and embrace a self-organizing context (Hoda and Murugesan, 2016; Maassen, 2018; Sithambaram, Nasir and Ahmad, 2021). Another significant challenge at the project level is the absence of an overall vision. In the context where each team member or the entire team, in the case of scaling, focuses on implementing small-scale requirements, there is a possibility for the overall project not to progress at the client's expected pace or to deviate from the client's perceived direction. At the same level, Ciric *et al.* (2019) mention two important challenges: the lack of predictability of delivered business value and visibility of client value at all levels (business, project, team, and customer), as well as the absence of a project management strategy, formal guidelines, and standard processes. Additionally, the lack of well-defined project requirements requires the team's ability to identify critical aspects and resolve them based on often undocumented client expectations. The rules, procedures, and standards are minimal, so system requirements specify precisely what needs to be done, but they do not provide details on how it should be done (Dybå and Dingsøy, 2015).

At the *team* level, challenges arise from finding a balance between cross-functionality, which enables self-organizing, and specialization, which allows for achieving better results in the shortest possible term (Hoda and Murugesan, 2016). The lack of clear role definitions can create difficulties at the team level (Ciric *et al.*, 2019). Estimation is another significant challenge due to the varying levels of competence among team members (Zahraoui and Idrissi, 2015). Finding an optimal balance between the time dedicated to estimation and its accuracy is necessary. Spending too much time on less important details reduces the time allocated to activities that truly bring value to the client. The adoption of APM must be preceded by preparing team members, familiarizing them with the specific practices of agile approaches, and assisting them in the initial stages of the change, as the lack of training and education can lead to significant failures (Kovaleva, 2020; Aghajani, Ahsan and Whiteside, 2023). The Covid-19 pandemic has led to changes in the implementation of agile practices, mainly manifested in the increased utilization of virtual environments for conducting meetings with clients and among team members (Sharma *et al.*, 2022; Kadenic and Tambo, 2023). In this context, at least in the initial stage, maintaining the duration of daily 15-minute meetings, as recommended by agile methods, has been a real challenge. Additionally, pair programming needed to adapt to the new conditions of remote work.

Regarding the *individual* level, Hoda and Murugesan (2016) consider it a challenge for each team member to take on tasks proportional to their abilities. In APM, task distribution is achieved through task ownership by each team member, not through delegation. As a result, there is a possibility that some individuals may take on tasks that are either too complex or too simple compared to their abilities and knowledge. An equilibrium between each team member's competencies, task complexity, and the level of workload is necessary to ensure progress both for the project and team members. To avoid waste and bottlenecks, many agile teams use work-in-progress (WIP), a Kanban practice that limits the maximum number of work items in the different stages of the workflow.

At the *task* level, the main challenges identified are determined by acceptance criteria and dependencies between tasks, which can lead to chained delays, estimation difficulties, and the need to revisit tasks considered already completed (Hoda and Murugesan, 2016; Lei *et al.*, 2017; Castañón-Puga *et al.*, 2023). Additionally, difficulties may arise in addressing urgent requests, especially in agile frameworks where work is organized into sprints or iterations with predefined tasks for the upcoming period, which ideally should not be changed (Dybå and Dingsøy, 2015).

Identifying projects that are suitable for agile practices can be a challenge. As we already mentioned, APM does not fit every domain or team, and if it is deemed appropriate, transitioning from traditional methods to agile ones is a gradual process that should be done in stages to prevent potential failures. (Kalenda, Hyna and Rossi, 2018; Dumitriu, Meşniţă and Radu, 2019). Furthermore, even in the context of the current highly dynamic environment, resistance to change is considered a challenge for adopting APM, especially when scaling it at the organizational level (Kalenda, Hyna and Rossi, 2018).

5. CONCLUSIONS

The purpose of this paper is to highlight the main challenges of adopting APM in both software and non-software contexts. The success of these methodologies has led companies from various fields of activity to adopt them in project implementation or at the level of the entire organisation. The level of maturity they have achieved in software development has facilitated their easier adaptation to new specific environments. The identified challenges are related to projects, collaboration with clients, team member collaboration, or other specific activities.

Implementing agile at scale extends the impact of these challenges and introduces new ones that may be even more challenging to manage. This is because of the cultural and educational differences between fields and people from various countries and regions. However, aligning towards the same common objective, namely the successful completion of the project or the successful

execution of business activities, can serve as a motivating factor in finding solutions for these challenges.

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THE EFFECTS OF SUBSEQUENT EXTERNAL FINANCIAL CONTROL

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Abstract

Being a component of economic control, financial control is based on a better knowledge of the ways of managing material or financial means by public institutions, as a means of preventing deficiencies, analyzing legality and finally restoring it when was violated.

In another sense, the ways of respecting the application of the legislation in the matter, and strengthening the discipline related to the organization of public units, in order to obtain more efficient results, are considered.

The article analyzes the validity and legality of some contrary control reports issued at the level of the county audit chamber, given that the respective public unit was subjected to periodic external controls that aimed at the same legal objectives.

Keywords: *control; thoroughness; legality; institution; public.*

JEL Classification: K34.

1. INTRODUCTION

Financial control fulfills a preventive role, through the measures taken by the control bodies in order to eliminate the possibility of illegality in the activity of the controlled unit, as well as documentation with an impact on the substantiation of some financial decisions, in order to generalize the experiences positives found in the activity of the respective units.

Apart from the preventive financial control, aiming at the analysis of the activities of certain units from the point of view of necessity, opportunity or legality, in order to prevent some negative facts and the appearance of dysfunctions, the concurrent control is exercised during the performance of the activities, having the role of operative knowledge of the way of fulfillment of tasks.

Last but not least, knowledge of compliance with the legality of the acts and operations of the controlled unit can be achieved in the form of a subsequent control, after the actual execution of the analyzed acts.

As a procedure, financial control (Șaguna, 2003) contains specific acts and operations, having as its object the organization, development, but also the final capitalization of the analysis of the controlled unit. Regarding the capitalization

of the control action, it refers to the potential results of the procedure, namely the drafting of control documents, the establishment of measures to remove deviations, the fulfillment of recommendations by the controlled unit, as well as the need to apply sanctions.

The Court of Accounts, as a financial control institution, carries out an external, periodic, total, subsequent and execution control, being represented at the territorial level through the county chambers of accounts.

2. THE OBJECT OF FINANCIAL CONTROL

Subsequent control can be internal or external (Costaş, 2021), respectively carried out by bodies outside the controlled unit, such as the Court of Accounts, with the object of ascertaining the lack of knowledge or the way of interpreting the legal provisions, the failure to ensure the supervision of the compartments at an internal level, analyzing the appropriateness, legality and efficiency of the procedures applied by the controlled unit, drawing recommendations and imposing sanctions, the principles according to which the control is carried out being the regularity, economy and effectiveness of acts and operations for the use of public funds (Gherghina, 2020).

This form of control is applied at the local level through the county accounting chambers, the execution control being related to the way of fulfilling the legal provisions in the matter by the controlled public unit, which must enjoy thoroughness and legality, within complex relationships of a legal and economic nature (Şova, 2011).

In this sense, one of the aspects that can be the object of such a form of subsequent control, can be represented by the analysis of the functioning of the internal audit department of the controlled unit, given that its dysfunction could endanger the functioning of the entire entity .

Following the control, in case of detection of malfunctions in the activity of the internal audit department, it leads to the introduction by the control inspectors, through the control report, of a measure aimed at non-compliance with the provisions of Law no. 672/2002 regarding the provision of the organizational and functional framework necessary for carrying out the internal public audit activity, the detected deviation is related to non-compliance with legality, respectively to the violation of legal norms regarding the audit activity within the respective institution.

The introduction of such a measure had to be related to the guilt of the controlled public unit, with reference to the description of the identified deficiency, when from the verification of the internal audit activity within the entity it emerged that although the organizational chart included an audit department with a number of two senior auditors, the structure however, it was non-functional, thus no internal audit mission was carried out during the controlled period.

Taking into account the provisions of art. 109 of the Regulation on the organization and conduct of activities specific to the Court of Accounts, as well as the capitalization of the documents resulting from these activities approved by the Court of Accounts plenary decision no. 155/2014, the external public auditor also has the right to proceed to extend the period subject to verification in the event of a violation being found.

In this sense, if following the extension it is found that even before the period subject to control in the controlled public entity, no audit mission was carried out, although the internal audit department was provided for, but only one auditor position was occupied out of the two that would have led to the achievement of its functionality, the measure imposed in the control report would have had a solid and legal foundation.

However, the situation is more complex in the conditions where the public unit has been subjected to a subsequent control several times, including by the same control body, but the control teams have different views on the legality of its activity.

3. INTERNAL FINANCIAL CONTROL

The internal control action can also be carried out by public auditors from the internal public audit service of the relevant ministry, the superior public entity of the controlled unit, in which case the inspectors can find that the approved organization chart also included an internal audit department. As a result of the analyzed data and the finding of the lack of functionality of the internal audit department, the recommendation imposed in the control report required its organization and operation in the presence of at least two auditors, according to the provisions of art. 2 letter f of Law no. 672/2002 of the internal public audit.

If only one auditor position was occupied in the controlled unit, the organization of the compartment was to be carried out by means of supplementing the number of positions, including by redistribution from other structures within the unit, and if this was not possible, by delegating specific duties to the head of internal audit department to the internal auditor already existing in the unit.

The recommendation of the control inspectors had initially to be followed by the issuing of a provision by the executive director of the controlled unit, by which the official who held the public office of auditor execution was mandated to exercise the powers of the head of the internal public audit department, with him to obtain the opinion of the internal public audit service of the relevant ministry, which would have allowed the coordination of the activity of drawing up and updating the Charter of the internal auditor, as well as the drawing up of multi-year and annual internal audit plans.

The compliance of the management of the public institution with the recommendation of the control report, by carrying out the duties of mandate of the internal public auditor for the purpose of coordination, is not sufficient, however,

in the event that he has not obtained the necessary approvals to obtain the position of head of the audit department internally, resulting in the impossibility of actually carrying out audit missions within the controlled unit.

However, the situation becomes interpretable under the conditions in which the mandated auditor, although he did not raise any objection to the new delegated duties, being relieved including of the previous tasks and did not criticize the decision of the management of the controlled unit for illegality, regarding his obligation to obtain the opinion of the Audit Service internal public of the relevant ministry, it did not comply with the order received.

We mention that, with reference to the provisions of Law no. 672/2002 on internal public audit, only the mandated auditor, after obtaining the approval of the relevant ministry and exercising the powers of the head of the internal public audit department, could approve the appointment by the management of the public unit of a second internal auditor, thus constituting the internal public audit department of the entity.

The question is thus raised whether, after taking steps at the level of the controlled unit to organize a functional audit department, followed by the achievement of this goal of entry into legality, there is a possible deviation from legality at the level of the controlled public institution, which could have subsequently to determine the application of appropriate sanctions. We take into account the fact that, the agreement of the responsible ministry regarding the alternative ways of organizing the internal audit activity at the level of the controlled unit was followed by the compliance with the recommendations of the control report, with management taking steps in this regard, but without as the final goal of the control action to be achieved, namely that of creating the conditions for carrying out internal audit activities.

It can thus be concluded that at the level of the controlled unit, the necessary measures have been taken to ensure the organizational and functional framework necessary for carrying out the internal audit activity, including the subsequent presentation of the reasons why the recommendation regarding the delegation of the specific duties of the head of the audit department to the internal auditor already existing in the unit did not determine the intended effect.

The measures necessary to ensure the organizational and functional framework necessary for carrying out the internal audit activity included the transmission to the competent ministry of the data regarding the existing situation within the public unit regarding the impossibility of carrying out the internal audit activity, but also the potential effects, in order to dispose at the level of the main orderer of the required legal measures, in application of the provisions of art. 11 letters a and f and 12 para. 2 of Law no. 672/2002.

In this sense, the law provided that the appointment of the head of the internal public audit department of subordinate public entities is carried out with the approval of the hierarchically superior public entity, the head of the subordinate

public entity maintaining a functional internal public audit department with the agreement of the superior public entity, the lack of agreement leading to the performance the audit by the internal public audit department of the public entity that decided this.

On the other hand, according to art. 22 paragraph 3 of Law 672/2002, internal auditors could not be involved in carrying out activities that they could potentially audit or in the development and implementation of the internal control systems of those public entities.

As a result, the non-functioning of the internal audit department could lead to the non-fulfillment of the general objective of the internal public audit within the entity, namely the improvement of management, by not auditing the financial activities or with financial implications carried out by the entity from the moment the commitments are made until the funds are used by the final beneficiaries, the payments assumed through budgetary and legal commitments, the administration of the patrimony, the establishment of public revenues, the allocation of budgetary credits, the accounting system and its reliability, the decision-making system, management and control systems, as well as the risks associated with such systems.

Also, the effects concerned the impossibility of carrying out the types of audits provided for in art. 14 of law 672/2002, respectively the audit of the in-depth assessment system of the management and internal control systems, the performance audit which assesses whether the results are in line with the objectives , as well as the regularity audit regarding the examination of actions on the financial effects on account of public funds, procedural and methodological rules.

4. THE VALIDITY AND LEGALITY OF THE ACT OF EXTERNAL FINANCIAL CONTROL

With regard to the subsequent control of the county board of accounts, it may have as its object the way of organizing the functional internal audit department, taking into account the previously ordered measures, respectively to ensure the organizational and functional framework necessary to carry out this activity within the public unit controlled, representing a form of external administrative control (Vedinaş, 2009).

However, the failure to achieve the organizational and functional framework necessary to carry out the public audit activity within the unit is not always an effect of the lack of action of the entity's management. In this sense, in parallel with the failure of the authorized internal auditor of the institution to obtain the approval requested for the position of head of the audit department, the budgets allocated by the relevant ministry did not allow new hires with the blocking of positions during the Covid-19 pandemic, these cumulative situations determining

the impossibility of achieving the functional framework of the internal public audit activity.

In addition, although the competent ministry had issued recommendations for the organization of a functional audit department by means of supplementing the number of positions or by redistribution from other structures within the unit, later a smaller number of positions was approved compared to those already existing in organizational chart of the controlled unit. The fact that the relevant ministry did not respond to the addresses of the controlled unit, through which it requested a reanalysis of the created situation, ultimately led to the impossibility of ensuring the internal audit department, a conditional aspect and the entry into force of Law no. 33/2021 for the approval of GEO no. 183/2020 regarding the holding during the state of alert of competitions for the filling of vacant positions within some institutions of the justice system, as well as within the Court of Accounts, which later allowed compliance by starting the procedures for the organization of contests to fill the vacancies related to the public function of auditors.

The method of carrying out the ordered measure was presented in the report of the chamber of accounts, a document that highlighted the fact that the ordered measure was fully implemented, even if there was still no functional internal audit department, under the conditions in which the controlled unit carried out all steps necessary for compliance, subsequently presenting to the relevant ministry the existing situation of the audit activity.

The report of the Chamber of Accounts stated that the ordered measure had an effective impact at the level of the controlled unit, in the sense of improving management, by implementing the previously imposed measures and by taking steps in this regard, a definitive act on the controlled aspects, affected by the presumption of legality and thoroughness.

In this sense, it can be considered that another subsequent effective control on the same aspects and which would cover the same period, would not give the possibility to another control team within the same control body to pronounce in a totally different way.

The context is obvious, since a control report mentioned the absence of deficiencies in the activity of the controlled public unit, the aspects having already been analyzed by the representatives of the chamber of accounts, they not identifying any deviation in the management of the entity for the controlled period.

However, under the conditions in which the external control of the court of accounts is periodic, another control team within the same control body cannot proceed to analyze the way of organization of the respective public unit in a contrary way, finding the existence of a deviation from ensuring the organizational and functional framework necessary for the performance of the public audit activity within the same entity.

As a result, the ruling on the same aspects at a new periodic control organized by another control team within the same county accounting chamber, could not

establish the violation by the public institution of the provisions of Law no. 672/2002, namely the failure to ensure the internal public audit activity, a fact contested by another previous control report in which legal compliance was mentioned.

5. CONCLUSIONS

The control fulfills a function of evaluating the situation found at the level of the controlled public unit, regarding the way of carrying out its activity under conditions of legality and reality.

On the other hand, the object of the control is related to the operations of the control team, in the analysis of the operations carried out by the controlled public unit, under conditions of legality, efficiency, operability, reality and economy.

Regarding the financial control documents, the main document is the control report, which contains the observed deviations, deficiencies, identified causes and consequences, an administrative document that enjoys thoroughness and legality.

In this sense, the effects of a control report issued by the inspectors of a county audit chamber, having as its object the duties or operations of a public unit in a certain period of time, cannot be canceled by issuing a second control report subsequently issued by another control team within the same control body.

As a result, if a first control report highlighted the fact that a measure ordered as a result of the control was fully implemented, with the public institution carrying out all the necessary steps that exclude the existence of a certain deviation, a second one having the same object would not be able to establish the existence of a deviations from legality.

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MARKETING FACTORS ENCOURAGING GIRLS TO BE MORE ENGAGED IN PHYSICAL ACTIVITY

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Abstract

This paper aims to gain deeper insight of the marketing factors that impact the frequency of physical activity among girls aged 6-12 in Israel. It is based on the understanding that regular engagement in physical activity is essential for both mental and physical health, and that starting at a young age is recommended. The research instrument is a semi-structured interview, designed to explore marketing factors that can encourage greater involvement of Israeli girls and young female adolescents in physical activity. The interviews have been conducted between July 2021 and March 2022 with a diverse range of individuals. The participants are girls involved in competitive sports, parents of competitive girls, women who have previously been active players, and decision-makers in academia and sports management positions. The research findings indicate three main themes obtained from the interviews regarding marketing. These themes highlight the importance of: 1. Branding physical activity as a culture of routine; 2. Promoting physical activity as a local culture; 3. Branding physical activity as a health promoter. It is widely acknowledged that sports play a crucial role in promoting a healthy lifestyle, especially when introduced to children at an early age for the purpose of cultivating lifelong healthy habits. This paper aims to provide insights into effective marketing techniques that can be applied on the state and local levels to promote an overall healthy lifestyle.

Keywords: *frequency of physical activity of girls; girls' sports; marketing and advertising; behavioral change; Athena project in Israel.*

JEL Classification: Z20, Z200, Z220.

1. INTRODUCTION

The aim of this paper is to explore the marketing factors that affect the frequency of physical activity among girls aged 6-12 in Israel. It is widely acknowledged that regular physical activity is essential for both mental and physical health, and starting at a young age is highly recommended. This is accomplished by examining the impact of marketing and advertising, specifically through the Athena Project as a case study.

This research aims to obtain insights that could have meaningful implications for Israel's future as a healthy and productive society, both nationally and internationally. The focus is on understanding how marketing strategies can help

in lowering barriers and promoting participation in sports activities among female adolescents, girls, and women in the Israeli society.

2. ATHENA PROJECT AS A CASE STUDY IN ISRAEL

Athena - the national Israeli Project for the Advancement of Women in Sports, has been implemented for over ten years under the supervision of the Israeli Ministry of Culture and Sport as part of a multi-year plan. The Public Council for the Advancement of Girls, Adolescents, and Women in Sports has operated since 2005, pursuant to the Israeli Government Decision 3416. The Council serves as an advisory body to the government, the Ministry of Culture and Sport, and the minister in charge, with respect of the promotion and development of women's sports in Israel.

Athena offers girls, adolescents, and women opportunities in sports through targeted programs in a variety of sport activities, sports organizations, projects at sports clubs, programs involving local authorities, and programs promoting female leadership in sports. Its activities involve girls and women of all ages in popular and competitive sports. Athena functions to identify, retain, promote, and support girls and women in all branches of sports, from girls in primary school and up to female athletes about to be included in Israel's Olympic delegation. "To Bring about Social and Gender Change in Israeli Sporting Culture, Ensuring Full and Equal Participation for Girls, Adolescents and Women in all Sports and at all Levels" (Ministry of Education, Sport and Culture, 2007).

Historically, women's sports activities have been at a disadvantage in terms of their number, status, and social standing in Israel and around the world. The number of girls and female adolescents steered toward sports, the number of competitive athletes, the budgetary allocations to women's sports over the years - all of these need improvement, if gender equality is to be achieved. Engaging in sports is a social, ethical, and educational tool. It impacts all social circles, beginning with the individual, through to the community and, finally, to society at large. It makes all those involved more equal and just, women becoming equal partners in the sporting arena.

Despite the Athena project in Israel in the last decade, the marketing activity, and the awareness of and sympathy for the Athena brand, there has been no considerable change in the number of Israeli girls and female adolescents who engage in sports. Their percentage has never exceeded 22%, although there has been an increase in the total number of female athletes and male athletes in Israel as well. Hence, the total number of female athletes has not dramatically grown (25,311), constituting 21.2% of the total female athletes and male athletes in Israel. The unexplained gap between the number of competitive female athletes at a young age and that of female athletes reaching an Olympic level, is unclear. Thus, the level of government policy has been promoted regarding the way of working for a more egalitarian society also in the field of sports.

The research aim of this study is: “What are the marketing factors that affect the frequency of physical activity of girls aged 6-12, while the research question is: “What marketing factors affect the frequency of physical activity of girls aged 6-12?”

3. LITERATURE REVIEW

3.1 The contribution of regular exercise at young age

Regular exercise has been shown to have essential benefits for adolescents' health. Engaging in physical activity helps in strengthening the body and improving physical well-being by reducing fat, enhancing metabolic processes, and increasing bone density. Additionally, exercise plays a crucial role in promoting the adolescents' mental health. Research findings show that exercises reduce symptoms of depression and anxiety, boost self-esteem, and improve the quality of relationships with spouses and family members. Moreover, research suggests that physical activity can have positive effects on cognitive functioning and academic attainments (Hallal *et al.*, 2006).

In a broader context, the promotion of gender equality and increased opportunities for women have been linked to various positive outcomes. Studies illustrate that greater gender equality in corporate settings can lead to increased profitability (Hunt, Prince, Dixon-Fyle and Yee, 2018), improved team intelligence (Woolley *et al.*, 2010), and enhanced scientific impact of intellectual collaborations (Joshi, 2014). Furthermore, findings show that strengthening gender equality can contribute to the overall economic growth of entire countries (Inglehart, Norris and Roland, 2003). These observations underscore the diverse benefits of regular exercising and the significance of promoting gender equality, not just for personal well-being but also for broader societal and economic development.

Studies conducted in Israel shed light on the way competitive sports accentuate gender disparities that favor men (Lissitsa, Galily and Chachashvili-Bololotin, 2010). Gender disparities become more pronounced when examining media coverage, the underrepresentation of women in news articles, and the absence of women in sports association management positions (Lissitsa, Galily, and Chachashvili-Bololotin, 2010). These factors reinforce social perceptions that portray sports as a predominantly male domain (Shoval, Shachaf, Ramati-Dvir and Shulruf, 2021; Seigelshifer, 2012).

Moreover, a study conducted in 2010 showed contrasting effects of engaging in competitive sports on the education of boys and girls. While girls who participated in competitive sports demonstrated higher educational attainments, boys involved in such sports exhibited lower academic performance. This disparity may be attributed to the socio-cultural context of Israeli youth and the differing levels of legitimacy attributed to boys and girls in their participation in competitive sports (Tamir and Galily, 2010).

These findings underscore the need for addressing and challenging the gender biases and inequalities prevalent within the realm of competitive sports in Israel. We have to exert efforts to promote equal opportunities, representation, and support for both men and women in sports, fostering a more inclusive and egalitarian sporting environment.

3.2 The stages of behavioral change

The integration of various components is a key aspect of the Transtheoretical Model (TTM) for behavior change. This model draws on multiple theories and constructs from different psychological frameworks to provide a comprehensive understanding of behavior change processes.

One of the key components integrated into the TTM is the concept of stages of change, which originated from the work of Prochaska, DiClemente and Norcross (1992). The stages of change theory acknowledges that individuals undergo distinct phases when altering their behavior, ranging from precontemplation to maintenance.

Another crucial element incorporated into the TTM is the construct of self-efficacy, which stems from the social cognitive theory, conceived by Bandura (1977). Self-efficacy refers to the individuals' belief in their ability to successfully execute the behaviors required for behavior change. It plays an essential role in affecting motivation and perseverance throughout the different stages of change.

Decisional balance, derived from the cognitive-behavioral model (Marlatt and Gordon, 1985), is another component integrated into the TTM. Decisional balance involves weighing the pros and cons of changing behavior, considering both the benefits and drawbacks associated with the desired change. This construct helps individuals at the contemplation stage in assessing costs and benefits of behavior change and making informed decisions.

Furthermore, the TTM encompasses processes of change, which are grounded in various psychotherapy approaches (Prochaska, DiClemente and Norcross, 1992). These processes represent the strategies individuals implement while progressing through the stages of change and overcoming barriers. Examples of processes of change include consciousness raising, self-re-assessment, and social liberation. By integrating these diverse components, the TTM provides a comprehensive framework for understanding behavior change and tailoring interventions to individuals' specific needs at different stages of change.

Behavior change is a complex process affected by various factors, including marketing activities. Johnson and Brown (2018) conducted a study that explored the impact of social marketing on smoking cessation. The researchers found that carefully crafted messages, combined with effective distribution channels, positively affected individuals' motivation to quit smoking. The study indicated that marketing efforts can play a crucial role in promoting behavior change,

particularly in the context of health-related behaviors. Chen, Williams and Davis (2019) examined the impact of marketing interventions on sustainable consumption behavior. The researchers investigated the effectiveness of eco-friendly product marketing in encouraging consumers to make environmentally conscious choices. The findings indicated a dramatic increase in the adoption of sustainable behaviors, such as recycling and reducing energy consumption, as a result of targeted marketing efforts.

4. METHODOLOGY

This article presents the findings of the initial phase of a qualitative study that is part of a larger research project conducted for doctoral studies. The aim of this study was to examine the marketing factors that could have an impact on Israeli girls and young female adolescents to increase their participation in physical activity. The data for this study were collected through semi-structured interviews conducted between July 2021 and March 2022.

The participants in the interviews included girls involved in competitive sports, parents of competitive girls, and women who had previously been active players, as well as decision-makers in academia and sports management. The twelve interviewees, both women and men, were carefully chosen, ensuring their connection to the world of sports in Israel and their meaningful roles in the Israeli national sports scene. The semi-structured interviews followed a questionnaire format with predetermined questions. However, the order of the questions and the inclusion of additional follow-up questions varied, depending on the progression of each interview.

All the participants gave their informed consent, after receiving an explanation of the research aim and the use of the interview data. The interviews were transcribed and content analyzed, resulting in the identification of two main themes and twelve related categories. This article specifically focuses on the first theme, which explores the marketing factors that influence girls and young female adolescents to engage in physical activity.

5. FINDINGS

The findings gave rise to marketing factors themes and related categories.

5.1 Branding physical activity as a culture of routine

"I have really liked sports, since I was young, I have always loved doing sports" (Interviewee 2)

"I say it's a tool for life, Sports as a matter of routine". (Interviewee 1)

"In Kiryat Ono, in the past, most children underwent a certain stage of their lives where they either learned swimming or played water ball since that was the primary option available. As a society, if we want children to understand the importance of sports and continue engaging in physical activities, it would be

beneficial to provide them with these frameworks throughout their journey until the age of 18. This would further emphasize how crucial sports is and prevent it from being remembered, at best, as a requirement solely before the military service". (Interviewee 9)

"I would create a comprehensive program related to the community, values, and cohesion. I may not have specific details to share with you, but I would connect the community and the neighborhood to the values of sports through various activities".

"I have just returned from a trip to Madrid, where I experienced this in an extreme way, but you know it can be quite oppressive. All the clubs there are within the district, within the neighborhood, with a multi-purpose facility, several pools, several fields, and several dojos for judo and taekwondo. All the girls and boys in that neighborhood are connected on a school level to the club".

"Comfort is an important factor as well. Everyone wants the activities to be right beneath their homes. So that it doesn't require transportation, so that it doesn't require a bus, so that there's no need for organization around it" (Interviewee 11).

5.2 Promoting physical activity as a local social culture

"The second aspect that is almost nonexistent in our sports field is the involvement of public figures in municipal authorities. In our organization, we have been focusing much more on community engagement for the past five years. We invest millions in community sports, which has brought about exceptional values".

"The municipality, in my opinion, just like it takes care of any other service, also needs to take care of sports. While the government manages the country, it is the local authorities that are responsible for sports. They should build the facilities, create clubs, and foster sports. They cultivate the community because they want to be directly elected by their residents, and it's important that the money coming from the residents returns to them. In Copenhagen, it is the dominion, the regime, the municipality that drives sports". (Interviewee 12)

"During the COVID-19 crisis, when there was a lockdown, but basically there was no training, so I went to practice on the basketball courts, me and my girlfriends, we went together to practice and play". (Interviewee 3)

"People who are closer to you affect you more". (Interviewee 3)

"In practice what brings girls to classes are two things, either parents or friends". (Interviewee 4)

5.3 Branding physical activity as a health promoter

"I struggle to get my middle daughter to engage in sports because I believe it is beneficial for both her physical and mental well-being. I am convinced that sports culture is crucial for the body, mind, and overall health". (Interviewee 8)

"It is not just an interest of the Ministry of Sports, but an interest of the entire country that people engage in sports. It helps prevent obesity, reduces stress, and is something that the Ministry of Health and the Ministry of Education should address together. With more people participating in sports, there is greater understanding and awareness of the importance of a healthy lifestyle and physical activity. As my brother once said, "I insist that Ella (my niece) joins a sports club - she must be active".

There is a growing awareness towards more sports and a healthy lifestyle, but it is more prevalent among adult women and less so among girls, in my opinion. The same is prevalent in Arab society, but it is still limited and not properly organized". (Interviewee 9)

"The body is so important, and sport is so good for it, and I prefer that sports be my refuge". (Interview 2)

"We also hear more and more recommendations from doctors. Does your back hurt? did you gain some weight? You should go for a swim, or you need to go for a walk for at least half an hour".

"And Athena's true slogan is 'When you engage in sports you always win' ". (Interviewee 1).

6. DISCUSSION AND CONCLUSION

The findings of this study indicate the presence of three prominent themes that emerged from the interviews, highlighting the importance of effective marketing strategies in the promotion of physical activity among Israeli girls and young female adolescents. These themes revolve around branding physical activity as a culture of routine, enhancing it as a local culture, and emphasizing its role as a health promoter.

Firstly, the interviews underscored the meaningfulness of branding physical activity as a habitual culture. By emphasizing the importance of integrating regular exercise into daily routines, girls were motivated to engage consistently in physical activity.

Secondly, promoting physical activity as a local culture emerged as a crucial factor in encouraging girls to participate. By highlighting local events, community initiatives, and role models who embody an active lifestyle, girls felt a sense of belonging and were more likely to embrace physical activity as part of their identity.

Lastly, the interviews demonstrated the importance of branding physical activity as a promoter of health. By emphasizing the physical, mental, and emotional benefits of engaging in regular exercise, girls were inspired to adopt an active lifestyle and prioritize their overall well-being.

By incorporating evidence-based marketing strategies, organizations and policy-makers can contribute to the promotion of healthier and more sustainable behaviors within communities.

The aim of this paper is to provide valuable insights into effective marketing strategies that can be implemented on both the state and local levels for the purpose of enhancing a healthy lifestyle among girls aged 6-12. By understanding and utilizing these marketing factors, policy-makers, educators, and health professionals can tailor their efforts to increase girls' participation in physical activity and foster lifelong healthy habits.

Overall, this study highlights the essential meaning of effective marketing in shaping girls' attitudes and behaviors towards physical activity. By implementing targeted strategies that are in line with the identified themes, it is hoped that positive changes can promote a culture of active living among Israeli girls and young female adolescents.

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INFLUENCE OF FINANCIAL-BANKING STABILITY ON ECONOMIC DEVELOPMENT

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Abstract

From an economic point of view, the countries of Central and Eastern Europe show a similar level of prevention, perception but also response to more or less anticipated situations, which have characterized these last decades. It is true that some of these are also part of the Schengen Area (Hungary, respectively Slovakia) not only of the European Union (Romania, respectively Bulgaria). However, the manifestation of socio-political phenomena, fueled by the crisis, the pandemic, demonstrated that all these countries are equally affected, and the decisions taken led, on the one hand, to mitigating and even limiting the negative effects, and on the other hand, to an economic growth, starting from 2021, which is around the European Union average. Thus, the study proposes, based on multivariate regression, to analyze both the influence of macroeconomic indicators on the economic environment, as well as the influence of financial stability on sustainable development at country and regional level. The reference period includes the years: 2001 - 2021, with an annual data frequency.

Keywords: *economic development; macroeconomic indicators; financial stability; multivariate regression.*

JEL Classification: C33, E44, E60.

1. INTRODUCTION

The dynamics of events, from the last decade, seem to leave their mark more and more seriously on the way in which the governments of the member states, of the European Union, manage and, at the same time, counteract the negative effects

of the pandemic, socio-economic conflicts, political and even military, on the business environment. The latter, as is known, is highly dependent on investments that support not only reforms in key sectors, such as banking, but also provide stability, necessary for harmonious development, based on the strategies carefully developed, with a long-term vision.

The current geopolitical context requires more carefully elaborated analyses, which concretely support the economic environment. It is characterized by significant fluctuations both at the level of macroeconomic indicators and in terms of the way of relating, action, regarding the decisions that need to be taken. Decisions, which should be assumed, prudent and take into account the economic power of each region or even country. Thus, the analysis is carried out on 4 central and European states (Romania, Bulgaria, Hungary, Slovakia), significantly affected by the events of the last two decades.

The banking system has always represented a standard, a pillar on which the state/government can rely. That's why we want to support and encourage him to offer credits in those sectors, based on realistic plans drawn up, which can really develop and create possibilities for expansion at the national, regional and, why not, international level. On the other hand, the financial crises have seriously left their mark on this system, which has repositioned itself, on the one hand, out of the desire to save itself, and on the other hand, to further support the state's efforts, embodied in projects in the field of infrastructure, research-innovation, sustainable growth, and development.

The objective of the research is represented by the analysis of the most important indicators, with pronounced impact on the economic environment and implicitly of its development, in a financial context that presents fluctuations, at least interpretatively. At the same time, it is desired to find the best/current, viable measures to counteract the negative effects, in order to ensure the premises of growth and then sustainable development at the level of the region.

Although the analysis, in terms of the evolution of the most important indicators (for example, such as stock markets) does not show variations, as abrupt as during the last world crisis (2008 - 2012), it is recommended that any measure and decision that must be adopted to wear, at least a few characteristics, namely: prudence, a much more responsible assumption in terms of decisions, on the part of the truly responsible factors and, last but not least, flexibility to allow adaptation to any event unforeseen.

Also in this sense, we consider that the study is up to date, in the current political-economic environment and can represent a real support both for the academic environment and for the foundation of important decisions, at the state level with direct implications on the sustainable development at the community level.

2. THE SCIENTIFIC CONTEXT

Economic development, as defined or rather understood by the financial environment, encompasses a set of measures that ultimately aim at harmonizing the policies instituted by the government, the purpose of which is the fruition of growth opportunities, with notable results, in - an environment characterized by various disturbances, among the most unforeseen with a significant impact on the banking system.

Moreover, banking competition plays a particularly important role in terms of the efficient functioning of financial markets and therefore its regulation is one of the key objectives of financial policy at the state level.

The studies in the field captured the evolution but also the impact of the policies and measures instituted over time intervals, characterized by significant fluctuations of the most important indicators, whose response and result highlight an important aspect, namely that of its dependence in relation to economic development. This is materialized, on the one hand, due to the need for liquidity in the market, and on the other hand, a stable financial system ensures linear but also constant growth, with benefits for investments and investors with direct implications and on the incomes of the population.

Thus, Albuлесcu (2008) emphasizes the "construction" of an aggregate financial stability index, which would represent one of the most used methods for evaluating the level and dynamics of the stability of the financial sector. In other words, the "construction" of such an aggregate financial instability index (ISF), would represent, along with the early warning systems and stress tests, one of the quantitative methods by which the stability of the financial system of a state and even a region is measured. Early warning systems allow making predictions about the probability of a financial crisis (and especially a currency crisis) but do not offer the possibility to include in the calculations all the risks to which the system is exposed, nor do they provide information about the capacity its response to internal or external shocks. Techniques such as "stress testing" allow the identification of potential shocks and estimate the resistance of the financial system, but they do not allow for comparisons between the level of stability in different periods or between the degree of stability of the financial systems of two or more countries. Aggregated indices of financial stability instead allow for comparisons between different periods and systems and allow observing the evolution of the level of stability.

The results show a positive trend of the aggregate index in the period 1998-2006, with an emphasis on the period 2001-2004. At the same time, its advantages consist in the simplicity of the calculations, in the accessibility of the data and in an adequate level of transparency. These indices give analysts the possibility of making some comparisons in terms of instability between several financial systems and allow them to observe the dynamics of financial stability. On the other hand, the disadvantages or rather the deficiencies of the method are also

important. It is difficult to accurately predict the onset of a crisis or measure the system's ability to withstand potential shocks.

In the sense of the above, it is also noted that after Romania's accession to the European Union in 2007, the capital account was completely liberalized and the level of financial intermediation improved, showing a favorable evolution. By maintaining this trend, the Romanian financial system will be able to be prepared from the point of view of financial stability to join the euro zone. The method used in the present study also allows the integration of forecasts in the performed calculations.

Other authors, Abusharbeh *et al.* (2017) have studied whether or not the development of the banking industry can support the economic development of a country. The results showed that bank loans are positively related to economic growth, which proves that the development of the banking sector contributes to improving the productive capacity of the economy.

Jayakumar *et al.* (2018) analyzed the interaction between banking competition, banking stability and economic growth, using a vector error correction model (VECM). The results of the study demonstrated that banking competition and banking stability have a long-term influence on economic growth in Europe. Bitar and Tarazi (2019) investigate the effect of banking competition and financial stability on the economy by examining panel data from 38 European countries over the period 2001-2017. Basically, it looks at how bank stability (i.e., non-performing loans and bank Z-score) and banking competition affect economic growth.

Using a fixed-effect estimator to control for cross-sectional heterogeneity and a system GMM estimator to control for endogeneity and the dynamic growth relationship, this study finds strong evidence that banking stability is crucial for economic growth, especially during times of crisis. Economic growth declines during the global financial crisis as well as during a period of local banking crisis. Moreover, a solid financial stability can neutralize the negative effects of the crisis on economic development.

The results of the study support the idea that decreased competition in the banking sector increases economic growth. Also in this sense, the empirical results of this study also show that market power in the banking sector can support economic growth and increase financial stability. In all this dimension, analyzed, an important role is played by decision-makers and regulatory authorities, whose activity refers to banking competition and the financial stability of banks, helping them, at the same time, to develop appropriate regulations.

Boot *et al.* (2020) empirically investigate the negative effects of the spread of the SARS COV2 virus on the business environment. It has seriously left its mark, in the sense of the drastic reduction of economic activity worldwide and with it the emergence of new risks in terms of financial stability. The lack of cash liquidity on the market can lead to a new banking crisis, not only at the European

level but also worldwide, therefore it is very important that the monetary policy measures counteract these apparently hypothetical situations, in order not to further endanger the activity firms/companies with state or private capital.

At the same time, alongside these monetary policy measures, other practices are required, much more pressing and carefully directed to support the financial-banking system, in the sense of increasing confidence in it, especially in those countries whose economy can become sensitive to market fluctuations, from the European level. In the sense of what has been presented, reference is also made to the fact that, unlike the crisis of 2008 - 2012, with acceptance for the period 2010 - 2011, the current configuration does not, however, present an equally high risk that would really create anxiety and measures immediate countermeasures to it.

Danisman and Tarazi (2020) analyze how financial inclusion affects the stability of the banking system at European level. The financial crisis, 2008 - 2012, was the triggering element, which demanded/imposed on the decision makers concrete measures to stabilize the banking system and at the same time promote financial inclusion, so that its effects do not repeat themselves.

The results suggest that advances in financial inclusion through multiple account holdings and digital payments have a stabilizing effect on the banking industry. Moreover, an aspect worth mentioning refers to the young people of society, who must be encouraged, educated in this sense, with increased attention to the rural environment and those areas / regions where information "reaches harder".

Bach Phan *et al.* (2021) investigate the impact of economic policy uncertainty on financial stability, for a reference period between 1996 - 2016, on a sample of 23 countries.

The essence of the examination of this hypothesis comes from the key role played by the financial system, which if functioning well facilitates the flow of funds and ensures the productive allocation of resources. At the same time, the flow of information should not be neglected, which is essential for the functioning of a financial system, since saving and investment decisions are made after participants have evaluated all their existing options. Furthermore, the factors that disrupt the flow of information and generate financial instability, including rising interest rates, deteriorating financial sector balance sheets, deteriorating non-financial balance sheets, and increasing uncertainty, are both internal and external in nature. The hypothesis of the study refers to the increase of uncertainty as a source of financial instability.

This uncertainty increases information asymmetry because the characteristics of borrowers become opaque. In other words, it becomes increasingly difficult for lenders to distinguish credit risks during uncertain times (when the EPU is high), leading to a decrease in lending, investment and, consequently, a contraction in activity economic. The results of the analysis confirm that uncertainty disrupts the

flow of information, aggravates the problems of adverse selection and moral hazard, which in turn reduces liquidity in the financial system.

Hartwell and Djalilov (2021) state that financial institutions have embraced the idea of corporate social responsibility (CSR) over the past decade, especially in the banking sector, even as they have faced various challenges in the current uncertain economic environment. The study is based on a sample of 319 banks from 21 CEE countries, over a period of analysis between 2002 - 2014 and starts from a natural "question": Has this responsibility helped banks in their effort to become more stable through diversification or did it waste resources that could be used elsewhere?

The results of the analysis find that there is a heterogeneous effect of CSR on the stability of banks, but at the same time it can also represent a destabilizing effect for weaker banks and, at the same time, an additional commitment for companies that have reached a certain level of stability.

Elnahass *et al.* (2021) show that it is of paramount importance to examine the impact of the COVID 19 pandemic, on banking stability, at a global level in order to assess/capture possible recovery signals. The sample includes 1,090 banks from 116 countries, and the data has a quarterly frequency for the years 2019 - 2020. The outbreak has forced major international institutions and banks to reduce their growth forecasts.

Due to the unprecedented nature of this crisis, the impact on economic developments, in terms of financial stability, are quite difficult to quantify, but action must be taken to limit its effects, while providing real support to investors to support the continuation of reforms. For many economies, this aspect will mainly depend on the ability to restart, at optimal capacity, economic activities, while continuing to limit the risks to the health of the population, which involves, among other things, substantial expenditures on the part of the state. The results provide strong evidence that, for the banking sector, globally, the pandemic, mentioned above, had a negative impact on financial performance and stability, an aspect highlighted by the evolution of the indicators that characterize this phenomenon.

Other authors, Khan (2022), analyzed the contribution of banking competition on macroeconomic stability and their role on financial stability. The results demonstrated that a high level of banking competition promotes macroeconomic stability.

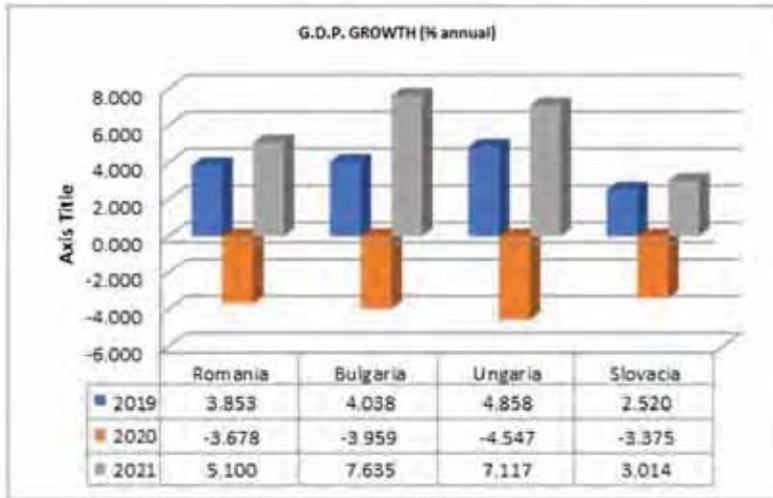
Baziki, Nieto and Turk-Ariss (2023) assess the sovereign-bank risk nexus by examining the effects of the composition of sovereign portfolios on banks' risk profile over a reference period between 2009 - 2018. The study shows that banks are riskier when their portfolio includes a higher proportion of securities that are issued by "sovereigns" with higher risk or when they are themselves domiciled in a country with high sovereign credit risk.

In the analysis, the risk profile is noted to be higher for banks that received government capital injections than for banks that did not receive capital support following the global economic crisis. On the other hand, banks that have received government capital injections are less risky when their portfolio includes a higher proportion of government-issued, higher-risk securities. These results reinforce the idea that the regulation of these assumptions, through arbitrage measures, at these banks are particularly important.

As can be seen, the strategies considered for a sustainable economic development must take into account, have in mind the maintenance of a financial-banking stability that allows, on the one hand, the continuation of the reforms and even their completion, and on the other hand, this system can substantially contribute to widening the platform through which the state can obtain liquidity, for example by issuing government bonds, with a reference period capable of supporting investments and implicitly the business environment, in its complexity.

We admit that the central pillar of sustainable development is represented by economic growth, which in turn is influenced by financial-banking stability. In this sense, the government, through the levers at its disposal, can support, through firm measures, ensuring the balance necessary for the good development of investment activity in key areas, capable, in turn, of encouraging and improving the degree of trust in relation to the population. The latter represents, as a percentage, a significant part of what banking activity means, because the services offered by this system are in a directly proportional relationship with the need for consumption, professional development and entrepreneurial development capable of adding value to an economic environment, which seems to be in a period of socio-political instability that needs to be very well managed at the level of the European state/states.

In this geopolitical context, economic growth is reproduced, analyzed also from the point of view of GDP. At the level of the analyzed states (Romania, Bulgaria, Hungary, Slovakia), the evolution of this indicator, if we consider the year 2019, the one before the outbreak of the COVID 19 pandemic (November 2019 Wuhan, China), respectively the years in which it experienced oscillations/fluctuations among the most diverse / unexpected, the situation is presented according to Figure 1.



Source: World Bank (2023)

Figure 1. GDP Growth

According to the data (Figure 1), we can see that the year 2020, in all the analyzed countries, represented a setback in terms of economic activity, a fact that weighed decisively in the evolution of this indicator and in everyday practice, at the European level.

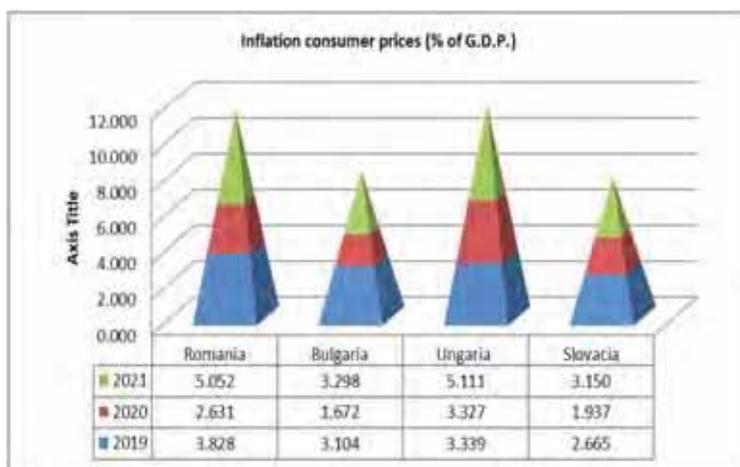
If we consider a comparative analysis with the average of the European Union, we can conclude that they are somewhat similar, with small variations. Thus, the measures instituted at the community level, as policies, strategies, but especially practices, made the economic activity increase, and even in some states, it (economic growth) came close to that before the pandemic.

More precisely, the average of the European Union, for the year 2021, indicates a value of 5.39% (World Bank, 2023), and the data regarding the analysis carried out, confirm that economic activity has increased, with values ranging between 3, 01% (Slovakia) and 7.63% (Bulgaria), and the prospects for development in the following semesters or even years are real, maybe not as significant (as percentages). At the same time, the pandemic waves had a very harmful effect, not only on the economic activity but also on the health of the population, so the governments of the European Union states have allocated significant amounts, in the field of emergency medicine, as well as in the of social insurance.

They had a significant contribution with implications on the level of accumulated public debt as well as regarding the degree/level of affordability of the economy. Surprising or not, this last aspect was not seriously taken into

account, because the evolution of the pandemic waves and the way they "presented" required allocations, much more than those predicted, to limit the effects of this virus, SARS-COV2.

The dynamics of the economy's evolution is influenced, in these last years, by another indicator with a pronounced impact, which can fuel certain imbalances related, rather, to purchasing power, income and is represented by inflation. A scourge that grinds, slowly but surely, any economy, no matter how strong it may seem to be, which in recent years has presented values that require a much more careful analysis, in the next period. These data are reproduced in Figure 2.



Source: World Bank (2023)

Figure 2. Inflation consumer prices (% of GDP)

The data show (Figure 2), in the last 3 years of the analysis, "average" values that are still worrying and require decisions that need to be studied much better, so that the level of this indicator shows a stable or even decreasing trend. The economic reality of the year 2022, also fuelled by the armed conflict on the eastern border of the European Union and with it the limitation of gas and energy imports, made the evolution of macroeconomic indicators and especially of inflation to grow constantly.

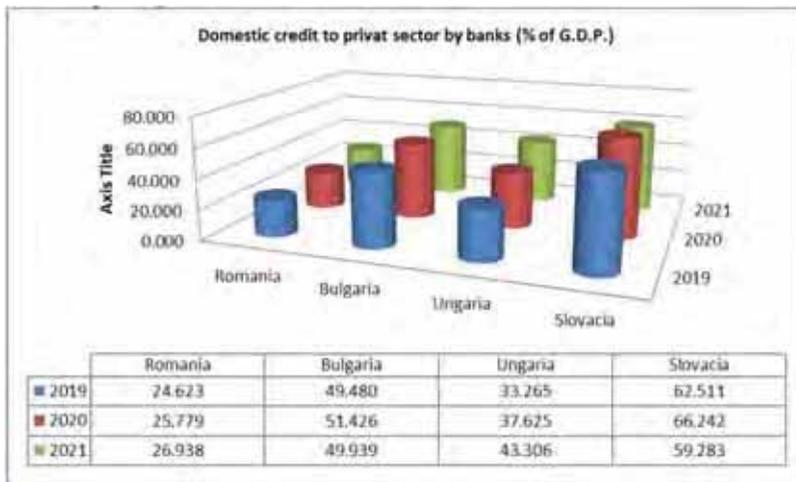
If at the beginning of the year, mentioned above, at the level of the analyzed countries, its value did not reach 10% of GDP, the end of the fourth quarter indicated a value, at least at the level of Romania, of over 15%. Also, in the sense of what was presented, at the level of the European Union, its value, as an average, for example for the month of December 2022, was approx. 10.6% of G.D.P.

The events, at least from the last decade, highlighted the importance of the state's actions to support the private sector, since it tends to a value of 75-80% of the total. These refer to those policies ready to offer a certain flexibility to

continuously develop and allocate important sums for promotion, research, professionalization of highly qualified personnel, which after all represent the most valuable resource that can be exploited, but also remunerated, to the same extent, able to bring added value in an uncertain economic environment.

It can also be viewed from the perspective of loans granted to the private sector by banks, which, as I stated, represent one of the pillars of economic growth, and whose stability provides security to the market, regardless of its more or less significant fluctuations and which fall within certain reasonable limits. We believe that these limits should not be imposed by policies in the field, but economic practice itself defines them, thus establishing certain thresholds that are more related to the level of development, affordability, and degree of self-sustainability of one's own economy.

Specifically, referring to the analyzed countries, the data are presented, according to Figure 3.



Source: World Bank (2023)

Figure 3. Domestic credit to private sector by banks (% of GDP)

From the perspective of the data presented, it can be observed, if we consider even the last year - as the analysis carried out - that Romania has the lowest percentage, in relation to Slovakia, a country that is part of both the European Union and the Schengen Area (2009).

This detail could be interpreted in the sense that the economy of our country, even if it stands as growth at a percentage worth mentioning (this is based more on consumption), still has many things to put in place in order to rise at a higher level, close to that of Slovakia (the highest among the analyzed countries), to then

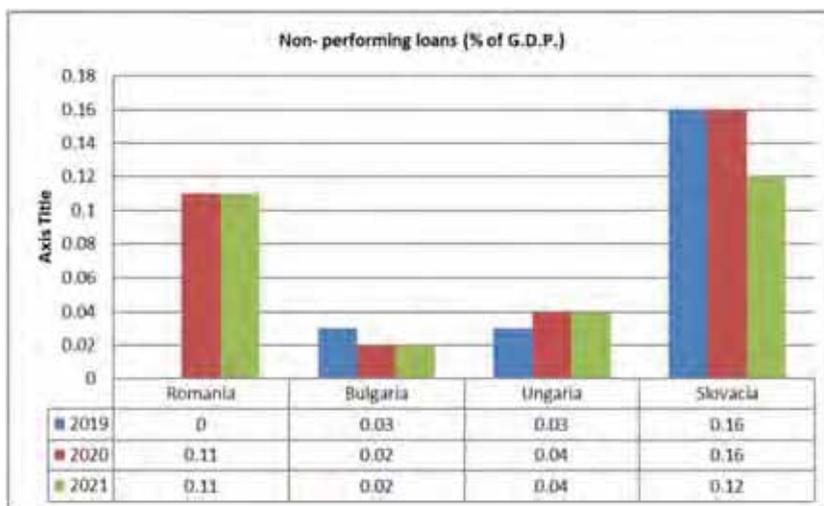
reach a level of approx. 90%, the average of the European Union year 2021 (World Bank, 2023).

This indicator speaks about the stability and at the same time trust, regarding the private sector in the whole economy, as a contribution and security both for the population, as remuneration and for ensuring the minimum criteria, from which a state can "benefit", in order to develop.

An equally important indicator, but whose effect on the economic environment, can cause various interpretations and even disputes as ideas/opinions, is represented by non-performing loans, because they are either directed to those less important sectors of the state, of the economic environment (even to cover budgetary, social expenses), or their effect as a forecast and amortization period do not present notable results that confirm the forecasts.

It is true that the last few years have led to significant changes in monetary policy, which has led to anxiety and even insecurity regarding how investors manage their funds, capable of supporting the economy. Thus, it is considered, as a forecast, based on a classification in terms of the country rating, the possibility of the fruition of any advantage capable of providing security and a certain profit, whether it is reinvested or not.

Regarding the countries under analysis, we note (in the last 3 years, 2019 - 2021), an oscillating evolution, a fact fueled by the existing imbalances, but whose effect must be immediately limited in order not to consider a recession, during the period immediately following. In Figure 4 the data on the mentioned credits are presented.



Source: European Commission (2023)

Figure 4. Non-performing loans (% of GDP)

These data can be analyzed both from a purely economic point of view, and especially from a socio-political point of view, considering the turmoil or rather the restlessness fueled, on the one hand, by the need for oil, gas and energy products that Europe seems to be dependent (to a greater or lesser extent), and on the other hand, on the evolution of the military operation in Ukraine, which has recently given rise to concern because an involvement of China would aggravate, rather than calm, "the waters" in terms of national and community safety and security.

In order to develop a country, with beneficial implications at the regional level, it needs economic and military stability. Unforeseeable situations can seriously affect the smooth running of things, which are based on strategies anchored in a less predictable reality, but whose results can give rise to optimistic forecasts for the following semesters, which must really be put to fruition.

3. METHODOLOGY AND DATA USED

The methodological framework aims to use the multivariate regression analysis method to capture both the evolution of the analyzed macroeconomic indicators and the influence of financial-banking stability on economic development. In this sense, the data used have an annual frequency, for a reference period of 2001 - 2021.

Regarding the chosen sample, we relied on the economic analysis of four, among those whose economy is representative of Central and Eastern Europe. Thus, according to the method of prevention but also response to the disturbances of the last decades, Romania, Bulgaria, Hungary, and Slovakia, respectively, distinguished themselves. In the analysis of the mentioned model, data were used regarding the evolution of a number of 11 macroeconomic indicators, with pronounced impact. The data source is made from the websites of financial institutions at the European and global level, as follows: Eurostat, OECD, World Bank, insse.

They comprise a number of 220 observations. As dependent variable we used GDP growth, and as independent variables we used monetary sector credit to private sector (% of GDP), domestic credit to private sector by BANKS (% of GDP), inflation consumer prices (%), revenue excluding grants (% of GDP), expenses (% of GDP), unemployment (%), foreign direct investment, net outflows (% of GDP), current account balance, long term interest rate (%), exchange rate.

In the first part of the analysis, we wanted to capture the evolution, for each country, of the mentioned indicators, in order to then make an interpretation at the level of a group of states, analyzed in order to have as complex a vision as possible, on how the events in the last decades have had on economic development.

Thus, in Table 1 the mentioned indicators are presented, subject to analysis.

Table 1. The variables used in the study

Symbol	Name	Measurement Unit
<i>DEPENDENT VARIABLE</i>		
gdp	GDP_growth	%
<i>INDEPENDENT VARIABLES</i>		
monetary_credit	Monetary sector credit to private sector	% of GDP
domestic_credit	Domestic credit to private sector by BANKS	% of GDP
inflation	Inflation consumer prices	%
rev_grants	Revenue excluding grants	% of GDP
expense	Expense	% of GDP
unemployment	Unemployment	%
fdi	Foreign direct investment, net outflows	% of GDP
c_balance	Current account balance	%
l_interest	Long term interest rate	%
e_rate	Exchange rate	%

Source: author's own processing

To analyze the influence of banking stability on economic development we will use the following regression:

$$y = \beta_0 + \beta_1 X_1 + \dots + \beta_n X_n + \varepsilon \quad (1)$$

And the form of this type of regression used in this research is:

$$gdp = \beta_0 + \beta_1 \text{monetar_credit} + \beta_2 \text{domesti_credit} + \beta_3 \text{inflation} + \beta_4 \text{rev_grants} + \beta_5 \text{expense} + \beta_6 \text{unemployment} + \beta_7 \text{fdi} + \beta_8 \text{c_balance} + \beta_9 \text{l_interest} + \beta_{10} \text{e_rate} + \varepsilon \quad (2)$$

where,

- β_0 = the constant of the model
- β_1 = the regression coefficient of the monetary_credit variable
- β_2 = the regression coefficient of the domestic_credit variable
- β_3 = the regression coefficient of the inflation variable
- β_4 = the regression coefficient of the rev_grants variable
- β_5 = the regression coefficient of the expense variable
- β_6 = the regression coefficient of the unemployment i variable
- β_7 = the regression coefficient of the fdi variable

- β_8 = the regression coefficient of the *c_balance* variable
- β_9 = the regression coefficient of the *l_interest* variable
- β_{10} = the regression coefficient of the *e_rate* independent variable
- ε = model error

Within Table 2 descriptive statistics are made for the country, Romania, which includes a number of 21 observations for all the variables included in the model. It is observed that during the period, the economy of this country presents an average value of G.D.P. of 3.803% which varies by +/- 4.234.

The *monetary_credit* variable registered an average value of 26.982% which varies by +/- 8.935.

Table 2. Descriptive Statistics for Romania country

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
	<i>gdp</i>	21	3.803	4.234	-5.52
<i>monetary_credit</i>	21	26.982	8.935	8.65	38.29
<i>domestic_credit</i>	21	26.98	8.935	8.65	38.29
<i>inflation</i>	21	7.315	8.245	-1.54	34.48
<i>rev_grants</i>	21	30.496	1.033	28.58	32.85
<i>expense</i>	21	32.592	1.66	30.73	38.04
<i>unemployment</i>	21	6.382	1.114	3.91	8.11
<i>fdi</i>	21	.244	.272	-1.12	.77
<i>c_balance</i>	21	-5.492	3.56	-13.7	-.28
<i>l_interest</i>	21	5.653	1.667	3.32	9.69
<i>e_rate</i>	21	3.41	.564	2.44	4.24

Source: author's own processing

Within Table 3 descriptive statistics for the country, Hungary, which includes a number of 21 observations for all the variables included in the model, are made. It is observed that during the period, the economy of this country presents an average value of GDP of 2.452% which varies by + / - 3.323%. The *monetary_credit* variable recorded an average value of 43.261% which varies by +/- 9.996%.

On the other hand, the *FDI* variable has values between -42.29 - 107.19% in the analyzed period. It can be observed through the prism of these values that the flow of investments recorded periods less conducive to the realization of investments.

Table 3. Descriptive Statistics for Hungary country

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
<i>gdp</i>	21	2.452	3.323	-6.6	7.12
<i>monetary credit</i>	21	43.361	9.996	32.39	60.19
<i>domestic credit</i>	21	43.307	10.009	32.34	60.16
<i>inflation</i>	21	4.035	2.429	-.23	9.12
<i>rev grants</i>	21	38.027	1.947	34.76	40.61
<i>expense</i>	21	43.069	1.839	39.03	46.93
<i>unemployment</i>	21	6.932	2.533	3.42	11.17
<i>fdi</i>	21	14.631	32.432	-42.29	107.19
<i>c balance</i>	21	-2.46	4.576	-9.88	4.55
<i>l interest</i>	21	5.8	2.283	2.23	9.12
<i>e rate</i>	21	239.866	42.109	172.11	308

Source: author's own processing

Table 4. Descriptive Statistics for Bulgaria country

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
<i>gdp</i>	21	3.293	3.278	-3.96	7.63
<i>monetary credit</i>	21	50.031	16.119	14.34	68.96
<i>domestic credit</i>	21	49.93	16.138	14.33	68.86
<i>inflation</i>	21	3.742	3.296	-1.42	12.35
<i>rev grants</i>	21	33.264	1.825	29.15	36.19
<i>expense</i>	21	32.636	1.944	29.65	38
<i>unemployment</i>	21	9.667	4.251	4.23	19.92
<i>fdi</i>	21	.9	.594	.07	2.19
<i>c balance</i>	21	-4.5	8.148	-25.74	3.36
<i>l interest</i>	21	3.722	2.129	.19	7.22
<i>e rate</i>	21	1.632	.213	1.34	2.18

Source: author's own processing

Within Table 4 descriptive statistics are made for the country, Bulgaria, which includes a number of 21 observations for all the variables included in the model. It is observed that during the period the economy of this country has an average GDP value of 3.293% which varies by +/- 3.278%.

The inflation variable recorded an average value of 3.742%, which varies by +/- 3.296%.

Within Table 5 descriptive statistics are made for the country, Slovakia, which includes a number of 21 observations for all the variables included in the model. It is observed that during the period the economy of this country presents an average value of GDP of 3.565% which varies by +/- 3.605%

The domestic credit variable registered an average value of 46.367%, which varies by +/- 11.425%.

Table 5. Descriptive Statistics for Slovakia country

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
<i>gdp</i>	21	3.565	3.605	-5.46	10.83
<i>monetary credit</i>	21	46.346	11.388	31.03	66.25
<i>domestic credit</i>	21	46.367	11.425	31.03	66.24
<i>inflation</i>	21	3.012	2.473	-.52	8.55
<i>rev grants</i>	21	35.482	2.052	32.43	40.63
<i>expense</i>	21	39.291	2.524	34.82	44.14
<i>unemployment</i>	21	12.343	4.209	5.76	19.38
<i>fdi</i>	21	1.166	1.233	-1.3	4.53
<i>c balance</i>	21	-3.326	3.014	-8.16	1.82
<i>l interest</i>	21	3.254	2.342	-.08	8.04
<i>e rate</i>	21	.932	.244	.71	1.61

Source: author's own processing

Table 6 contains the correlation matrix for the Romania country.

We can observe only one positive relationship between the variable G.D.P. and the FDI variable, respectively 0.230.

Table 6. Matrix of correlations for Romania country

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) gdp	1.000										
(2) monetary_credit	-0.348	1.000									
(3) domestic_credit	-0.348	1.000	1.000								
(4) inflation	0.191	-0.734	-0.734	1.000							
(5) rev_grants	0.325	-0.021	-0.021	-0.092	1.000						
(6) expense	-0.675	0.372	0.372	-0.305	-0.220	1.000					
(7) unemployment	-0.008	-0.122	-0.122	0.353	0.327	-0.427	1.000				
(8) fdi	0.230	0.014	0.014	-0.414	0.230	0.032	-0.555	1.000			
(9) c_balance	-0.428	0.021	0.021	-0.188	-0.225	0.160	-0.041	-0.060	1.000		
(10) l_interest	-0.166	0.347	0.347	0.203	-0.178	-0.036	0.422	-0.491	-0.475	1.000	
(11) e_rate	-0.212	-0.084	-0.084	-0.401	-0.262	0.360	-0.597	0.467	0.600	-0.786	1.000

Source: author's own processing

Table 7 contains the correlation matrix for the Hungary country.

We can observe a single positive relationship between the variable GDP and the variable e_rate, respectively 0.246.

Table 7. Matrix of correlations for Hungary country

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) gdp	1.000										
(2) monetary_credit	-0.533	1.000									
(3) domestic_credit	-0.530	1.000	1.000								
(4) inflation	-0.066	0.255	0.256	1.000							
(5) rev_grants	-0.341	0.138	0.139	-0.474	1.000						
(6) expense	-0.512	0.564	0.563	-0.269	0.461	1.000					
(7) unemployment	-0.474	0.815	0.816	0.066	0.207	0.695	1.000				
(8) fdi	-0.353	-0.014	-0.019	0.041	-0.013	0.026	-0.270	1.000			
(9) c_balance	-0.235	-0.047	-0.048	-0.670	0.809	0.362	0.174	-0.102	1.000		
(10) l_interest	-0.275	0.620	0.622	0.597	-0.289	0.288	0.680	-0.279	-0.472	1.000	
(11) e_rate	0.246	-0.752	-0.754	-0.290	0.163	-0.341	-0.696	0.176	0.381	-0.787	1.000

Source: author's own processing

Table 8 contains the correlation matrix for the Bulgaria country. We can observe a close connection between the variable G.D.P. and the variable rev_grants, respectively 0.483.

Table no 9 contains the correlation matrix for the Slovakia country. We can see that there are several negative relationships between the dependent variable and the independent variables entered into the model.

Thus, between GDP and the variables monetary_credit, domestic_credit, rev_grants, express, FDI and c_balance, respectively -0.490, -0.489, -0.394, -0.562, -0.191 and -0.544.

Table 8. Matrix of correlations for Bulgaria country

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) gdp	1.000										
(2) monetary_credit	-0.476	1.000									
(3) domestic_credit	-0.477	1.000	1.000								
(4) inflation	0.544	-0.215	-0.215	1.000							
(5) rev_grants	0.483	-0.263	-0.263	0.398	1.000						
(6) expense	-0.495	0.139	0.140	-0.476	0.222	1.000					
(7) unemployment	0.102	-0.568	-0.568	0.084	-0.361	-0.195	1.000				
(8) fdi	0.089	0.564	0.564	0.209	0.281	0.115	-0.584	1.000			
(9) c_balance	-0.449	-0.003	-0.002	-0.807	-0.466	0.255	0.080	-0.366	1.000		
(10) l_interest	0.046	-0.050	-0.052	0.375	-0.369	-0.368	0.552	-0.146	-0.437	1.000	
(11) e_rate	0.158	-0.813	-0.812	-0.074	0.103	0.023	0.473	-0.559	0.348	-0.220	1.000

Source: author's own processing

Table 9. Matrix of correlations for Slovakia country

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) gdp	1.000										
(2) monetary_credit	-0.490	1.000									
(3) domestic_credit	-0.489	1.000	1.000								
(4) inflation	0.253	-0.597	-0.595	1.000							
(5) rev_grants	-0.394	0.583	0.581	-0.523	1.000						
(6) expense	-0.562	0.004	0.004	-0.115	0.450	1.000					
(7) unemployment	0.258	-0.882	-0.883	0.531	-0.316	0.319	1.000				
(8) fdi	-0.191	0.242	0.240	-0.454	0.202	0.083	-0.230	1.000			
(9) c_balance	-0.544	0.588	0.586	-0.372	0.571	0.282	-0.347	-0.035	1.000		
(10) l_interest	0.247	-0.904	-0.905	0.617	-0.588	0.157	0.851	-0.300	-0.458	1.000	
(11) e_rate	0.196	-0.515	-0.514	0.545	-0.009	0.489	0.616	-0.274	-0.327	0.532	1.000

Source: author's own processing

Table 10 contains the multiple regression equation for the 4 countries individually.

Table 10. Linear regression

VARIABLES	(Romania) gdp	(Hungary) gdp	(Bulgaria) gdp	(Slovakia) gdp
monetary_credit	-90.71 (117.7)	-41.72*** (11.76)	11.58 (16.40)	-3.111 (4.290)
domestic_credit	90.87 (117.8)	41.61*** (11.77)	-11.68 (16.35)	2.967 (4.346)
inflation	0.157 (0.261)	0.189 (0.389)	-0.110 (0.342)	-0.793* (0.379)
rev_grants	0.273 (1.266)	-0.782 (0.521)	0.652 (0.612)	-0.0405 (0.517)
expense	-1.889** (0.603)	0.413 (0.474)	-0.937** (0.387)	-1.452*** (0.452)
unemployment	-0.705 (1.342)	0.154 (0.643)	0.241 (0.234)	0.233 (0.393)
fdi	-0.790 (4.178)	-0.0107 (0.0208)	1.848 (1.254)	-0.159 (0.506)
c_balance	-0.733 (0.430)	-0.234 (0.325)	-0.0532 (0.154)	0.0268 (0.281)
l_interest	-1.403 (1.257)	-1.642** (0.627)	-0.525 (0.550)	-0.410 (0.784)
e_rate	0.965 (4.755)	-0.0131 (0.0274)	-4.240 (5.956)	10.70** (4.305)
Constant	56.98 (45.57)	31.85 (21.58)	21.27 (24.38)	59.80** (19.05)
Observations	21	21	21	21
R-squared	0.764	0.835	0.780	0.805

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Source: author's own processing

It is observed that for the Romania country, there is only one statistically significant variable at the 90% threshold, namely expenses.

In the case of the equation for the second country, it is observed that 3 (three) variables are statistically significant, namely *monetary_credit*, *domestic_credit* and *l_interest*.

In the case of the equation for the Bulgaria country it is observed that the expenditure variable is statistically significant with a probability of 90%.

And in the case of the last regression related to Slovenia, it is observed that 3 (three) variables are statistically significant: inflation, expenses and *e_rate*.

This model also aimed at the analysis of these indicators from the perspective of the group of countries, namely Romania, Hungary, Bulgaria and Slovakia.

In Table 11 we presented the descriptive statistics of the variables analyzed in this study.

The results demonstrate that the highest standard deviation is recorded by the exchange rate variable (105.66%), which suggests that exchange rates influence economic growth.

Among the variables that recorded the lowest values are GDP growth, FDI, inflation, current balance, interest rate, an aspect that demonstrates the impact of the events of recent years (the global economic crisis, the crisis generated by the COVID-19 pandemic, etc.) on stability banks and the economy of any country.

Table 11. Descriptive Statistics

	N	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness		Kurtosis	Std. Error
						Statistic	Std. Error	Statistic	
<i>GDP_growth</i>	84	-6.598	10.832	3.27899	3.600484	-0.731	0.263	0.649	0.520
<i>Mon_credit</i>	84	8.653	68.959	41.68040	14.686789	-0.018	0.263	-0.616	0.520
<i>Dom_credit</i>	84	8.653	68.860	41.64587	14.686508	-0.017	0.263	-0.620	0.520
<i>Infl</i>	84	-1.545	34.477	4.52651	4.965527	3.375	0.263	16.927	0.520
<i>Revenue</i>	84	28.583	40.627	34.31731	3.284470	0.206	0.263	-0.892	0.520
<i>Expense</i>	84	29.646	46.932	36.89608	4.928913	0.284	0.263	-1.385	0.520
<i>Unemp</i>	84	3.420	19.920	8.83119	4.024427	1.065	0.263	0.487	0.520
<i>FDI</i>	84	-42.286	107.190	4.23511	17.043724	3.538	0.263	18.263	0.520
<i>Current_balance</i>	84	-25.740	4.552	-3.94495	5.256006	-1.451	0.263	3.769	0.520
<i>Interest_rate</i>	84	-0.080	9.694	4.60728	2.374339	-0.199	0.263	-0.603	0.520
<i>Ech_rate</i>	84	0.709	307.997	61.45976	105.667350	1.310	0.263	-0.089	0.520

Source: author's own processing

In Table 12 we presented the results of the correlation matrix, and we can see that there is a positive correlation between the variables current balance, interest rate and exchange rate.

Table 12. Correlation matrix

		GDP (%)	Mon_credit	Dom_credit	Infl	Revenue	Expense	Unemp	FDI	Current	Interest_rate	Ech_rate
GDP	PC	1	-.384**	-.383**	.213	-.118	-.315**	.045	-.199	-.381**	-.049	-.109
	Sig		.000	.000	.052	.285	.003	.687	.070	.000	.659	.325
	N	84	84	84	84	84	84	84	84	84	84	84
Mon_credit	PC	-.384**	1	1.000**	-.444**	.352**	-.240*	-.012	.038	.134	-.242*	.011
	Sig	.000		.000	.000	.001	.028	.917	.729	.224	.027	.924
	N	84	84	84	84	84	84	84	84	84	84	84
Dom_credit	PC	-.383**	1.000**	1	-.443**	.351**	-.240*	-.012	.037	.134	-.242*	.010
	Sig	.000	.000		.000	.001	.028	.914	.741	.223	.026	.931
	N	84	84	84	84	84	84	84	84	84	84	84
Infl	PC	.213	-.444**	-.443**	1	-.257*	-.248*	-.026	-.023	-.399**	.360**	-.068
	Sig	.052	.000	.000		.018	.023	.818	.835	.000	.001	.540
	N	84	84	84	84	84	84	84	84	84	84	84
Revenue	PC	-.118	.352**	.351**	-.257*	1	.794**	.030	.243*	.228*	-.188	.648**
	Sig	.285	.001	.001	.018		.000	.783	.026	.037	.087	.000
	N	84	84	84	84	84	84	84	84	84	84	84
Expense	PC	-.315**	.240*	.240*	-.248*	.794**	1	.098	.271*	.287**	.084	.698**
	Sig	.003	.028	.028	.023	.000		.375	.013	.008	.447	.000
	N	84	84	84	84	84	84	84	84	84	84	84
Unemp	PC	.045	-.012	-.012	-.026	.030	.098	1	-.175	.035	.183	-.315**
	Sig	.687	.917	.914	.818	.783	.375		.112	.754	.095	.004
	N	84	84	84	84	84	84	84	84	84	84	84
FDI	PC	-.199	.038	.037	-.023	.243*	.271*	-.175	1	.015	-.035	.379**
	Sig	.070	.729	.741	.835	.026	.013	.112		.892	.753	.000
	N	84	84	84	84	84	84	84	84	84	84	84
Current_balance	PC	-.381**	.134	.134	-.399**	.228*	.287**	.035	.015	1	-.362**	.192
	Sig	.000	.224	.223	.000	.037	.008	.754	.892		.001	.080
	N	84	84	84	84	84	84	84	84	84	84	84
Interest_rate	PC	-.049	-.242*	-.242*	.360**	-.188	.084	.183	-.035	-.362**	1	.216*
	Sig	.659	.027	.026	.001	.087	.447	.095	.753	.001		.048
	N	84	84	84	84	84	84	84	84	84	84	84
Ech_rate	PC	-.109	0.11	.010	-.068	.648**	.698**	-.315**	.379**	.192	.216*	1
	Sig	.325	.924	.931	.540	.000	.000	.004	.000	.080	.048	
	N	8	84	84	84	84	84	84	84	84	84	84

** . Correlation is significant at the 0.01 level (2-tailed);

* . Correlation is significant at the 0.05 level (2-tailed)

Source: author's own processing

According to the data presented in Table 13, among the analyzed variables, the statistically significant ones are constant (GDP), expenses, FDI, current account balance, long-term interest rate, exchange rate.

Table 13. Regression results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
<i>C</i>	14.14733**	5.570414	2.539727	0.0132
<i>Mon_credit</i>	-5.184100	3.644922	-1.422280	0.1592
<i>Dom_credit</i>	5.096961	3.646358	1.397822	0.1664
<i>Infl</i>	-0.053347	0.076390	-0.698344	0.4872
<i>Revenue</i>	0.228226	0.210327	1.085103	0.2814
<i>Expense</i>	-0.461252***	0.136992	-3.367004	0.0012
<i>Unemp</i>	0.294910***	0.108839	2.709598	0.0084
<i>FDI</i>	-0.041073**	0.020365	-2.016863	0.0474
<i>Current_balance</i>	-0.334144***	0.072675	-4.597790	0.0000
<i>Interest_rate</i>	-0.557502***	0.206828	-2.695489	0.0087
<i>Ech_rate</i>	0.019320***	0.006753	2.860978	0.0055
<i>R-squared</i>	0.493881		<i>Mean dependent var</i>	3.278992
<i>Adjusted R-squared</i>	0.424550		<i>S.D. dependent var</i>	3.600484
<i>F-statistic</i>	7.123498		<i>Durbin-Watson stat</i>	2.247596
<i>Prob (F-statistic)</i>	0.000000			

** . Correlation is significant at the 0.05 level;

***. Correlation is significant at the 0.01 level

Source: author's own processing

The results of the regression analysis demonstrate that banking stability influences the economic growth of the analyzed countries in a proportion of 49.38%. Thus, according to the p-value, the variables expenses, unemployment, current balance, interest rate and exchange rate, are statistically significant at a confidence level of 99%, which proves that they are the main factors of banking stability and economic growth in within the analyzed countries.

Also, constant and FDI are statistically significant at the 95% confidence level.

In other words, economic development is also dependent on the evolution of these tools and mechanisms that can represent, through their behavior, a beneficial factor, but also a disruptive factor that must be reduced in intensity and effect. By streamlining the practices aimed at limiting any unwanted effects, the aim is to raise the awareness, both of the decision-making and/or political factors, as well as of the multinational companies, of the importance of cooperation and relationships in the financial field and of the policies aimed at financing activities

with a real impact. By this, it is desired that the economic development remains at an acceptable and at the same time stable standard in order not to endanger the production and service activity, because this is the key to improving the performances and at the same time increasing the quality, which in turn can make a difference regarding one economy or another, from the European Union.

4. CONCLUSIONS AND PROPOSALS

In the contemporary context, the core of the activities in the banking system consists in holding financial assets. And modern economies use the following types of such assets, namely stocks, bonds, loans and finally, bank deposits. The crucial importance of this sector for the modern economy is supported, in particular, by its quality as the main provider of credits, and this simple quality makes the mentioned system the key point in terms of the expansion of economic development actions.

The financial crisis demonstrated how important it is, for economic stability, to find those mechanisms but also solutions that support the business environment, so that fluctuations in indicators and social-political events do not affect reforms, plans aimed at growth the quality and competitiveness of companies. We believe that precisely the lack of liquidity determined that domino effect that engulfed the USA, then Europe and other countries worldwide.

Those situations, such as degrading, want to be avoided, no matter how unsettling a given situation may seem, but at the same time it is noted that the political side that can be "translated" also through the armed conflict on the eastern border of the European Union has much more significant implications than expected. This factor, combined with the COVID 19 pandemic, whose effect seems to no longer be at an intensity that poses real problems, manages to create fluctuations in the capital market as well, and the stock indices seem to draw attention, through their behavior, that the economic situation at the European level is not exactly reassuring. Therefore, prudence is the element that characterizes any action, whether it comes from investors or from the state, as a cumulative budget of revenues and expenses.

In other words, the uncertain events both last years and of the present led to the deterioration of the banking sector, especially considering the sensitive macroeconomic situation of the four analyzed countries. One such example can be the collapse of several banks in recent weeks. Also, the economic crisis and the COVID-19 pandemic have demonstrated how important is the financial stability of the banking system, but also of the country's economy. Last but not least, I believe that the citizens of a country contribute significantly to the stability of the banking system, as a result of the way they manage their financial resources and bank deposits in crisis situations (such an example can be the moment when the COVID pandemic broke out -19 and the armed conflict between Russia and

Ukraine, when the inhabitants of the affected or neighbouring countries wanted to liquidate their bank accounts).

From another point of view, in the financial-banking activity one can observe an insecurity argued also by the weak management of the mentioned system in the United States, where two large banks seem to have great problems to resist on the market. This gives shivers because it is also from this consideration, treated superficially, that the economic crisis from 2008 to 2012 broke out, with repercussions that are difficult to manage, which weighed heavily in terms of the level of accumulated public debt.

Even if the state authorities give assurances that the situation is under control, the large banking consortia believe that restricting activities or summarizing only the most important ones can represent an element of safety, in order not to be "touched" even more by a possible recession, unwanted. Even some representative banks, such as that of Switzerland (Credit Suisse), are in a free fall on the American market from the beginning of 2023. However, this can also be a growth factor for the central bank of the mentioned state (Switzerland), by absorbing it and creating a much stronger fund, able to face the new challenges on the interbank market.

The banking financial system in Central and Eastern Europe is also dependent on the variations at the international level, but it relies on the most responsible action that allows the practices that aim to continue the reforms to be carried out in good conditions, having, at the same time, in view of the financial support granted by the European institutions, which must necessarily be fruitful in order to create that environment conducive to sustainable development. It will allow the support of research and development actions/activities, with important allocations in strategic fields, capable of bringing added value.

Regarding the proposals for the efficiency of the economic activity, from the perspective of its financing, an increasing emphasis is placed on the granting, by banks, of loans to those structures/companies that present real chances of development, which can create stable, remunerated jobs accordingly with a vision and significant contribution, not only to the state budget. Moreover, the aim is to reform the entire system, adaptable to the new challenges of the market, which after the last "episodes" presents important fluctuations / variations that can create imbalances that are difficult to manage.

The gross domestic product in the analyzed countries, as shown by the data, is at acceptable levels, which makes them affordable from an investment point of view. Forecasts in the field show a positive evolution for the following quarters of the current year, provided that the allocation of funds targets those branches with a particular impact on the entire economy. In other words, investors must be encouraged through firm policies to continue to pay special attention to those sectors bringing profit, by diversifying them with at least a medium-term and even long-term vision.

The analysis is carried out in dynamics, which in turn present oscillations, among the most diverse with different impact, and which require special attention on the way of managing the resources available or to which a state can have access, in an area/ region with a real development potential.

Thus, according to what was presented, we consider that the topic analyzed is current, having a significant impact both on the population and on the economic development of the analyzed countries.

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EXPLORING EUROPEAN INTEROPERABILITY REFERENCE ARCHITECTURE (EIRA)

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Abstract

EIRA stands for European Interoperability Reference Architecture and represents a European Union Commission initiative concerning public services integration. In fact, the European Commission (DG Informatics) started the ISA² Programme (Interoperability Solutions for Public Administrations, Businesses, and Citizens). In this context, the new European Interoperability Framework was first elaborated and stated several directing principles or recommendations. There are twelve underlying principles of the EIF such as subsidiarity and proportionality, openness, transparency, reusability, technological neutrality and data portability, user-centricity, inclusion and accessibility, security and privacy, multilingualism, administrative simplification, preservation of information, and assessment of effectiveness and efficiency.

Subsequently, EIF was implemented by the EIRA. This reference architecture represents a metamodel defining the architectural building blocks (ABBs) to build interoperable e-Government systems. EIRA is aligned with the principles of TOGAF (The Open Group Architecture Framework) and follows a technology and product-neutral, and service-oriented architecture (SOA) style.

Consequently, to implement public and government services, the EU offers a computing-oriented definition of such an architecture as an extension of the open-sourced ArchiMate® model. The specific viewpoints formalized by ArchiMate model refer for example to the Interoperability Privacy viewpoint, Interoperability Governance viewpoint, Interoperable European Solution viewpoint, and Interoperability Security viewpoint.

EIRA should support the following activities: (1) designing, (2) assessing, (3) communicating and sharing, and (4) discovering and reusing of eGovernment solutions. The specialists targeted are Enterprise Architects as well as Solution Architects, Business Analysts, and Portfolio Managers.

Keywords: *EIRA; Public Services; eGovernment; Software Interoperability; Application Integration; SOA.*

JEL Classification: L86, C88, M15.

1. INTRODUCTION: EUROPEAN INTEROPERABILITY REFERENCE ARCHITECTURE [EIRA] CONTEXT

Our objective in this paper is to elaborate an opinion based on an initial exploratory analysis of the EU initiatives concerning integration in a common digital space, especially from a technical perspective.

We found EIRA as the most relevant and supported initiative in this direction, so our effort took into consideration some research questions targeting problems like:

- If EIRA has a sounding and solid conceptual basis.
- If there is a certain potential and a certain perspective for adopting EIRA.

1.1 European Commission (DG Informatics) - ISA² Programme

ISA² was a funding programme of the European Union that supported the development of digital solutions for public administrations, businesses, and citizens (European Union, 2017a). ISA² represented the commitment of the EU Commission to develop a Digital Europe that is “inclusive, transparent, fair, and accountable” (European Union, 2017b). There were two European initiatives that preceded and founded this programme:

- Tallinn declaration of the E-Government states principles for digital government policy and interoperability policy (European Union, 2017c).
- Berlin Declaration on Digital Society and Value-Based Digital Government stands for ensuring high quality, user-centric, and seamless cross-border digital public services for citizens and businesses and developing a future-oriented European single market (European Union, 2020).

These declarations prove the real and supportive interest of the EU Commission in this domain of digital interoperability. ISA² has evolved into Interoperable Europe - the initiative of the European Commission for a reinforced interoperability policy.

1.2 EIF: European Interoperability Framework

The European Interoperability Framework (EIF) is one of the most important results of the ISA² Programme - continued by the Interoperable Europe initiative is EIF - the European Interoperability Framework.

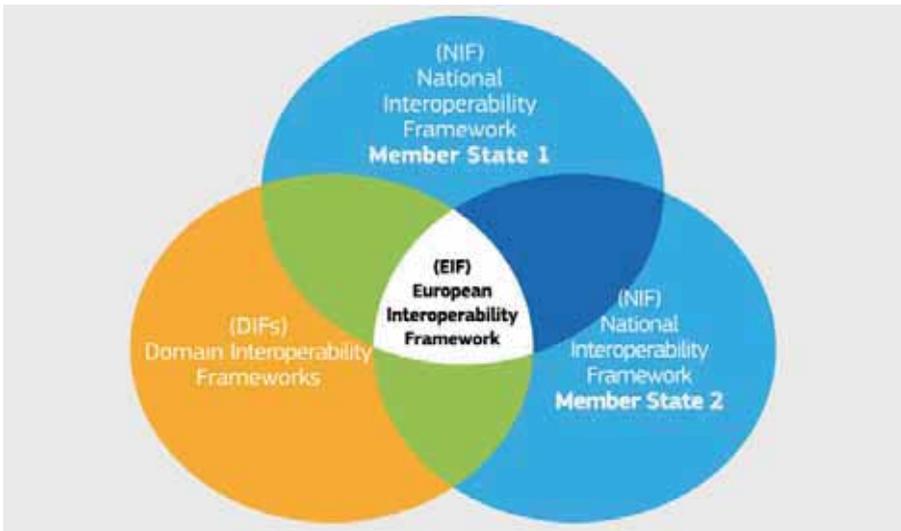
EIF represents a European initiative to promote “seamless services and data flows for European public administrations”. EIF states the underlying principles of European public services:

1. Subsidiarity and proportionality
2. Openness
3. Transparency
4. Reusability
5. Technological neutrality and data portability

- 6. User-centricity
- 7. Inclusion and accessibility
- 8. Security and privacy
- 9. Multilingualism
- 10. Administrative simplification
- 11. Preservation of information
- 12. Assessment of Effectiveness and Efficiency

These principles are grouped into four categories (European Union (a), 2017): 1. The principle setting the context for EU actions on interoperability (1); 2. Core interoperability principles (2 to 5); 3. Principles related to generic user needs and expectations (6 to 9); 4. Foundation principles for cooperation among public administrations (10 to 12).

Also, EIF defines and takes into consideration the following interoperability frameworks: the National Interoperability Frameworks specific to each member state, and various Domain Interoperability Frameworks which are functional-oriented. The relationship between these frameworks is illustrated in Figure 1.



Source: European Union (2017a)

Figure 1. Relationship between EIF, NIFs, and DIFs

2. FROM EIF TO EIRA: EUROPEAN INTEROPERABILITY REFERENCE ARCHITECTURE

EIRA is an architecture content metamodel “defining the most salient architectural building blocks (ABBs) needed to build interoperable e-Government systems” (European Union, 2023). EIRA provides a common language to be used

in the development lifecycles of the interoperable e-Government systems, extends the ArchiMate language as a modeling notation and uses SOA architectural style, is meant to implement European Interoperability Framework (EIF).

The main characteristics of the European Interoperability Reference Architecture could be synthesized as:

1. Common terminology to achieve coordination.
2. Reference architecture for delivering digital public services.
3. Technology-and-product-neutral and a service-oriented architecture (SOA) style.
4. Alignment with EIF and TOGAF.

2.1 The Open Group Architecture Framework: TOGAF Foundation For EIRA

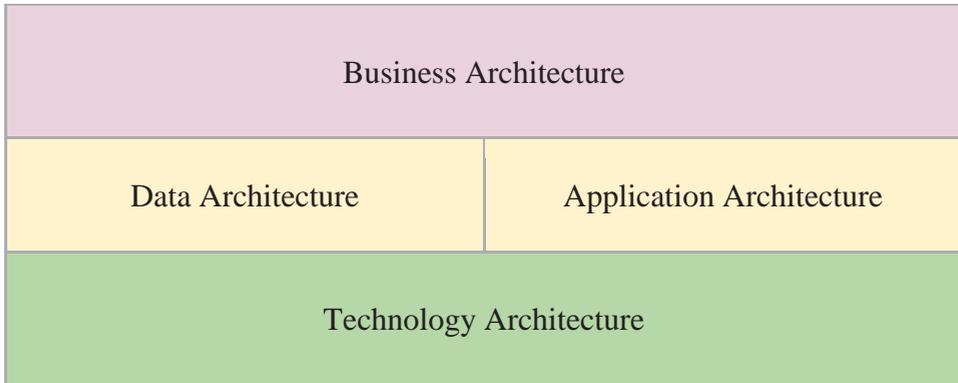
TOGAF is a methodology to design and develop Enterprise IT Architectures: “TOGAF takes a high-level approach to the framework that an enterprise uses to plan, design, implement, and manage its Enterprise Architecture” (Priyadharshini, 2023). The Enterprise Architecture of TOGAF is decomposed into 4 domains (see Figure 2):

- Business Architecture
- Data Architecture
- Application Architecture
- Technology Architecture.

The EIRA conceptual foundation is inspired from the TOGAF’s architectural principles like (TOGAF, 2023):

(Business Principles)

- Principle 1: Primacy of Principles
- Principle 2: Maximize Benefit to the Enterprise
- Principle 3: Information Management is Everybody's Business
- Principle 4: Business Continuity
- Principle 5: Common Use Applications
- Principle 6: Service Orientation
- Principle 7: Compliance with Law
- Principle 8: IT Responsibility
- Principle 9: Protection of Intellectual Property



Source: TOGAF (2023)

Figure 2. EA domains conform to TOGAF

(Data Principles)

- Principle 10: Data is an Asset
- Principle 11: Data is Shared
- Principle 12: Data is Accessible
- Principle 13: Data Trustee
- Principle 14: Common Vocabulary and Data Definitions
- Principle 15: Data Security

(Application Principles)

- Principle 16: Technology Independence
- Principle 17: Ease-of-Use

(Technology Principles)

- Principle 18: Requirements-Based Change
- Principle 19: Responsive Change Management
- Principle 20: Control Technical Diversity
- Principle 21: Interoperability

In conclusion, one could say that the EIRA foundation is based on one of the most solid frameworks targeting Enterprise Architectures. The role of the EIRA consists of translating this foundation into the domain of public services in the EU common space.

2.2 ArchiMate: A Tool For Modeling The Enterprise Architecture

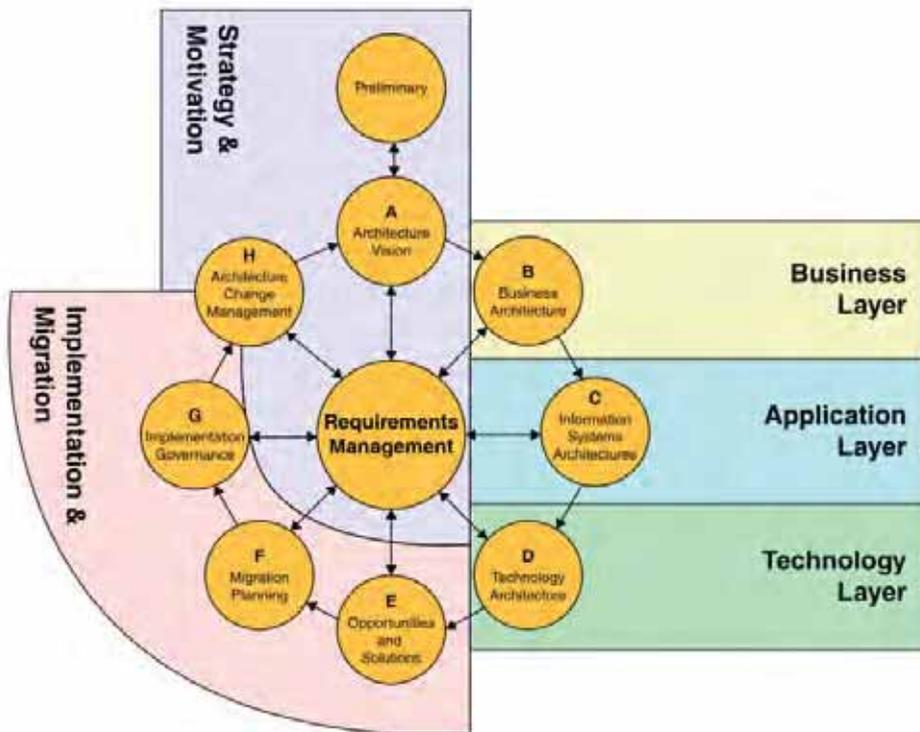
ArchiMate is an open and independent modeling language for Enterprise Architecture. The ArchiMate modeling language “provides a uniform representation for diagrams that describe Enterprise Architectures and offers an integrated approach to describe and visualize the different architecture domains together with their underlying relations and dependencies”.

The ArchiMate is a complex and complete tool for EA and the underlying standards that support it are:

- TOGAF (The Open Group Architecture Framework)
- BPMN (Business Processing Modelling Notation)
- UML (Unified Modelling Language)
- BIZBOK Guide (Business Architecture Body of Knowledge Guide)
- BMM (Business Motivation Model)

Consequently, the meta-model (conceptual model) that ArchiMate proposes is aligned with TOGAF principles (see Figure 3).

To formalize the EIRA architectural principles, the Archimate tool could provide the platform to build a specific extension.



Source: ArchiMate 3.1 Specification (Josey, 2019)

Figure 3. ArchiMate alignment with TOGAF

2.3 EIRA Extension Of The Archimate: Key Concepts

The Key Concepts to leverage Archimate for EIRA-specific principles are the following (European Union, 2023):

- *EIF interoperability level* which is “a set of guidelines for developing public services”.
- *EIF principles* which are underlying principles of European public services (see 1.2 section).
- *EIRA view* which consists of a graphical notation of the EIRA ontology for each EIF principle.
- *EIRA viewpoint* which “provides a perspective with specific stakeholders' concern in mind”.
- *Architecture Building Block (ABB)* is defined as an “ abstract component that captures architecture requirements and that directs and guides the development of Solution Building Blocks”.
- *Solution Building Block (SBB)* which “is a concrete element that defines the implementation and fulfills the required business requirements”.
- *Solution Architecture Template (SAT)* is a concrete specification including a sub-set of Architecture Building Blocks.
- *Reference Architecture* ensembles the components, principles, and guidelines that define an architectural solution (an EA solution).
- *Solution Architecture* is defined as a definition of Reference Architecture using ABBs.
- *Solution* as an implementation of a Solution Architecture using SBBs

The most relevant EIRA architectural models/views are the *Legal view*, the *Organisational view*, the *Semantic view*, the *Technical view* (composed of an application and infrastructure part), and the European Interoperability Framework *Underlying Principles view*.

Consequently, the most relevant viewpoints are defined as:

- *Conceptual Model for Integrated Public Service Provisioning* viewpoint
- *EIRA Ontology* viewpoint
- *High-level* viewpoint
- *Interoperability Governance* viewpoint
- *Interoperability Privacy* viewpoint
- *Interoperability Security* viewpoint
- *Key Interoperability Enablers* viewpoint
- *API* viewpoint
- *Interoperable European Solution* viewpoint.

2.4 EIRA Building Blocks

The EIRA Building Blocks formalized as Archimate constructs are defined for each of the aforementioned EIRA views: legal, organizational, semantic, and technical. Some of the Legal, Organisational, and Semantic view ABBs are resumed in Table 1.

Table 1. Legal, Organisational, and Semantic ABBs of EIRA

The Legal view	The Organisational view	The Semantic view
Legal Agreement	Organisational Agreement	Semantic Interoperability Agreement
Legal Interoperability Agreement	Organisational Interoperability Agreement	Master Data Policy
Public Policy Cycle	Interoperability Strategy	Open Data Policy
Shared Legal Framework	Interoperability Framework	Data Portability Policy
Architecture Principle	Security Framework	Data Mapping
Detail-Level Architecture Requirement	Detail-Level Architecture Requirement	Distributed Ledger
	Solution Specification	Ontologies Catalogue
	Digital Public Service	Ontology
	Digital Public Service Delivery Model	Data Set Catalogue
	Digital Public Service Delivery Machine Agent	Data Set
	Digital Public Service Delivery Human Agent	Data Model
	Digital Public Service Delivery Consumer	Data Syntax

Source: EIRA 6.0.0 Specifications (European Union, 2023)

Also, Some of the ABBs to define a technical solution from the technical view are presented in Table 2.

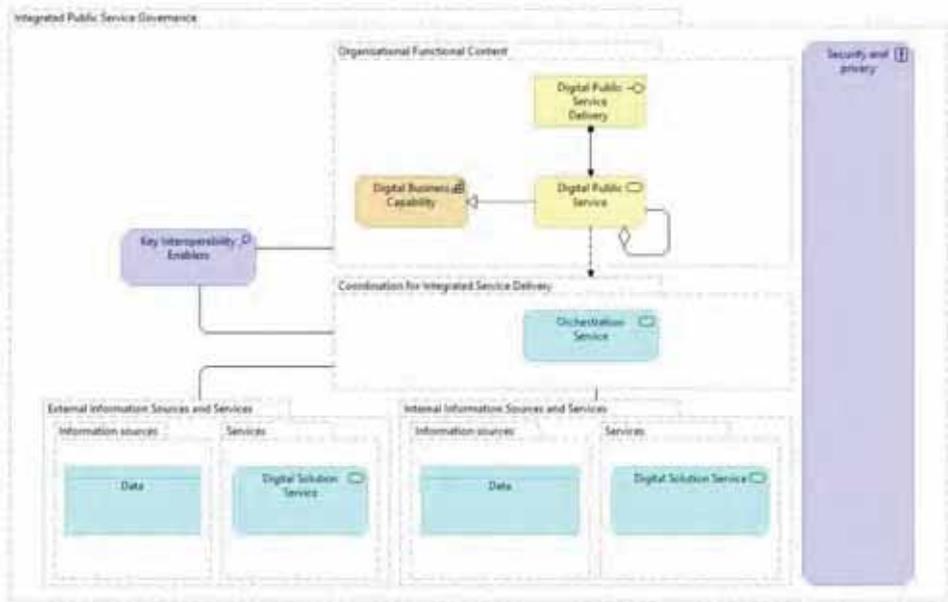
Table2. Technical ABBs of EIRA

The Technical view - Application	The Technical view - Infrastructure
Technical Interoperability Agreement	Solution Specification
SaaS, PaaS, IaaS	Outsourcing
Interoperable Digital Solution	SaaS
Machine to Machine Interface	PaaS

The Technical view - Application	The Technical view - Infrastructure
Human Interface	IaaS
Digital Solution Service	Computing Hosting, Networking, and Data Hosting Infrastructure
Digital Solution Component	Application Service
Shared Platform	Data Access Service
API Discovery and Catalogue Service	Intranet Service
API Catalogue	Remote Desktop Service
API	VPN Service
Service Registry	Web Service
Service Discovery and Registry Service	On Premise Facility
Software Component Discovery and Catalogue Service	Application Interface
Software Components Catalogue	Data Interface
API Catalogue Component	Intranetwork Service
Web Service	Data Virtualization
Service Registry Component	Data Warehouse
Software Component Catalogue Component	Data Server Software Environment
Orchestration Service	Data Lake
Orchestration Component	Data Hub

Source: EIRA 6.0.0 Specifications (European Union, 2023)

Figure 4 pictures an example of a ABBs composition to describe a Solution Architecture using EIRA ArchiMate extension.



Source: EIRA 6.0.0 Specifications (European Union, 2023)

Figure 4. ABBs composition of an EIRA Solution

One could see clearly that the EIRA is elaborated/positioned not only as a *standard* to specify interoperability European solutions but also offers the necessary *tools* to design and document these solutions.

3. CONCLUSIONS

From the beginning, the EIRA initiative objective was very ambitious: to define a powerful tool to design public/eGovernment services that could easily interoperate within national and EU space. The EIRA Specification is now at the sixth iteration, so one could say that this standard has reached a stable maturity level. There is no doubt that EIRA formal and technical foundations are sound, due to the underlying standards that support it, but, in our opinion, there are several questions that need further investigation:

- The formal specification needs a Reference Architecture Implementation POC (Proof of Concept) to validate it.
- An extensive study across the EU members is needed in order to build a solid evaluation of the adoption of the proposed architectural approach.
- The EIRA specification needs more elaborated principles, views, and building blocks for Cloud-based architectures, in the context of the large spreading of eGovernment-Cloud-based platforms.

ACKNOWLEDGEMENTS

This work was supported by a grant from the Romanian Ministry of Research, Innovation and Digitization, CNCS - UEFISCDI, project number PN-III-P4-PCCE-2021-1878, within PNCDI III, project – Institutions, Digitalization and Regional Development in the EU.

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POSSIBILITIES OF IMPLEMENTING SUSTAINABILITY MANAGEMENT IN EDUCATIONAL AND PUBLIC HEALTH INSTITUTIONS

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Abstract

The present paper represents a complex theoretical-practical approach, focused on elucidating the possibilities of implementing sustainability management in higher education institutions and in the public health system. Just as sustainability represents a fundamental premise in the creation of the green economy, a valence of the EU-2030 Agenda, we believe that public institutions must, in turn, align their policies, action plans, with the approach of achieving sustainability. The purpose of the research is to highlight the possibilities of implementing sustainability management in higher education institutions and those in the public health system. The objectives of the research are: researching of conceptual approaches regarding sustainability management; elucidating the methods of achieving sustainability in public institutions; highlighting the specifics of sustainability management in institutions in the public system; highlighting the challenges of implementing sustainability management in public institutions. The general hypothesis of the research is Ho: sustainability management is the fundamental factor for increasing the competitiveness of higher education institutions and public institutions. The epicenter of the research was based on the theoretical research of the main aspects of sustainability management, complemented by the empirical one, focused on the research of the main challenges in the implementation of sustainability management in public institutions. As a research method, we used content analysis, analyzing the official reports of public institutions, which allowed us to evaluate the possibilities of implementing sustainability management in public institutions. In the conclusions, we can reiterate that sustainability management is the fundamental pillar of ensuring the competitiveness of the economy, basic premises in the creation of the green economy. Thus, as a result, we believe that institutions in the public system must urgently implement sustainability management, which will help them become competitive, credible, attractive on the national market, as well as on the international one. Aligning policies, activities, public institutions with the approach of achieving sustainability, will help public institutions to increase their strategic competitiveness, notoriety, as well as to increase consumer trust in the services offered.

Keywords: *sustainability management; higher education institution; sustainability assessment; public health.*

JEL Classification: Q01, Q56, I23.

1. DEFINITION OF SUSTAINABILITY

The dynamism and turbulence that characterizes the activity environment of higher education institutions as well as the public health institutions require the application of safe, concrete measures in order to achieve sustainability through the prism of capitalizing on human potential, in the context of the innovative changes that occur daily. The need for higher education institutions and those in the public health system to be competitive, sustainable, derives from the increase in competitive pressure, from the need to align with international standards, in order to attract students to higher education institutions, on the one hand, and treating patients to the highest standards, on the other. Thus, sustainability in higher education institutions and within the institutions of the public health system must be nurtured at a fast pace, ensuring the promotion of economic, social and environmental equity.

The topicality of the research question resides in the need for universities and medical institutions to outline a safe route to sustainability, which can only be ensured by applying sustainability management in the context of innovative changes punctuated by the new framework. The universities of the Republic of Moldova are faced, along with other higher education institutions abroad, with multiple problems and challenges that they must deal with daily, finding tangible solutions that could provide them with a firm path to competitiveness.

This work represents a theoretical-practical substantiation of the defining aspects of sustainability management, focused on human potential as a decisive factor in ensuring sustainability in higher education institutions.

The need to research these aspects is imperative, because together with the desire to connect to international standards, together with the need to face the requirements put forward by professional bodies from abroad, the need to form a theoretical-applicative basis, to substantiate the innovation field, which can only be shaped with the help of capitalizing on the innovative culture of young specialists, contributing to the formation of the innovative potential of the higher education institution.

Postmodern education with its directions (e-learning, e-tutoring, life-long-learning, responsible education, sustainable education, distance education, etc.) can break stereotypes, stimulate the generation of innovations, facilitate the educational process, and can also increase its efficiency, but also the competitiveness of higher education institutions.

We believe that the main tool that higher education institutions along with the institutions in the public health system can capitalize on in the cultivation of postmodern education is the development of the human potential of teachers, students, researchers, and the awareness of their connection to the new demands of postmodern society.

The researcher Costel Istrate, professor at the UAIC university of Iasi, in his work “Sustainability in higher education – models, declarative intentions,

achievements, evaluation and proposals for action”, mentions that sustainability and sustainable development are terms that he will use in the same context in his work (Istrate, 2019, p. 37).

According to the expert on sustainability, the director of the Institute of Corporate Governance and Sustainability, within the UAIC, Agheorghiesei-Corodeanu, the concept of sustainability, originating from the English language, was adapted in the Romanian area with the notion of “sustainable development”. According to the researcher “sustainable development is a dynamic process, of achieving balance on the 3 dimensions: economic, social, environmental, while sustainability is an output of sustainable development, a result obtained by companies/institutions that align with the sustainable development process (Onofrei and Agheorghiesei, 2019, p. 13).

If we were to make an analysis of the practical applicability of the concepts of *sustainability*, *continuous development*, *sustainable development*, in the higher education system, then we can note that all the commissions, centers, institutes, student associations that are concerned with the issues of aligning institutions of higher education to achieve the Sustainable Development Goals, from higher education institutions abroad, have taken over the concept of sustainability.

At the same time, analyzing the alignment of the Babeş-Bolyai University in Romania, we can note that the university uses the concept of *sustainable development* to report the efforts made by the university in the alignment of achieving the Sustainable Development Goals. Therefore, within the university, both the section on the university website and the report published by the university use the concept of sustainable development (UBB, 2023).

2. RESEARCHING THE CONCEPTUAL FRAMEWORK OF SUSTAINABILITY

Researching the conceptual framework of sustainability, we can mention that Glavic and Lukman (2007), in their works, examined the term sustainability where they point out that “the earth belongs to each generation during its existence, which belongs to it fully and in its entirety, no generation can make higher debts than can be paid during its own existence” (Glavic and Lukman, 2007). Interpreting the researchers’ approach, we stipulate that sustainability implies the need to consume responsibly, to show strategic concerns regarding the well-being of future generations, who have the right to live in a better society. Each generation is responsible for its consumption, its behaviour towards itself and its stakeholders. Thus, it follows that sustainability implies a corporate responsibility that everyone must demonstrate in order to achieve sustainability.

In the same context, Brawn mentions that “sustainability is the concept that encapsulates the supporting capacity and has long been used by biologists, and until now has only rarely been considered by economists”. The time has come when economists, and not only them, must consider the “supporting capacity” of

resources for carrying out any activity regardless of the organization in which it is carried out (Simonis, 2008).

At the same time, Ellis (2003) in his studies, elucidates that sustainability is “the doctrine of urgency by which development and economic progress must take place and be maintained over time, within the limits established by ecology in the broadest sense – through the interdependence of human beings and their jobs, the biosphere and the laws of physics and chemistry that govern it. It follows that environmental protection and economic development are indeed antagonistic processes” (Ellis, 2003). From the interpretation of the conceptual approach, we specify that the researcher understands by sustainability a cooperation between economic well-being and the development of the society, an effective interaction between the economic, social and environmental aspects. Thus, if we want to demonstrate sustainable behavior, we must be concerned with ensuring a balance between the economic, social and environmental dimensions of sustainability. Although achieving balance often seems unattainable, however, applying effective levers, principles and methods could support achieving the desired balance.

In addition, Muscoe (2005), approaches sustainability from the perspective of *retaining or supporting from the bottom*. “A community must be supported from the bottom – by current and future residents. Some places, through their specific combination of physical, cultural and perhaps spiritual characteristics, inspire people to care for their community. These are the places where sustainability has the greatest chance of existence” (Muscoe, 2005). From the sustainability approach, we can reiterate the need to strengthen efforts, at the level of the entire society, from the bottom up, in order to ensure a better future, through the prism of the concerns expressed to ensure the economic-social-environmental balance.

The researcher Somerville, Williams (2015), deals with sustainability from the perspective of the results, the performances generated by it. Thus, the researcher reiterates that “sustainability is more of a process than a result. In fact, one member of the sustainable city agenda committee stated that the major concept of sustainability is: [...] a journey, not a destination” (Somerville, Williams, 2015). Interpreting the essence of the sustainability approach, we can see that sustainability is not a result, but more than that, it is a dynamic process, a complex approach, which manifests implications at the level of the functioning of systems in order to ensure balance. Sustainability is a journey, so it is a process that manifests and involves several actors, stakeholders, who can positively influence the achievement of sustainability through responsible behavior, through rational consumption, through the prism of concerns for the future of society, the environment.

On the other hand, Tavanti (2010), in his studies, mentions that “sustainability is nothing but “meeting the needs of the present without

compromising the ability of future generations to meet their own needs”. In practice, sustainability is a collective concern for the well-being of our children and future generations” (Tavanti, 2010). Interpreting the approach, we discover that the researcher focuses, in the foreground, on the concerns expressed by the present generation to secure the future, in order to create better conditions for future generations. This approach is a complex one, given the fact that it involves the efforts of the entire society in ensuring the economic-social-environmental balance.

In our opinion, *sustainability represents the process of ensuring development and progress, in the context of ensuring a balance between ecological security, social equity and economic well-being, through which present generations do not disrupt the access of future generations to resources and show responsible behavior towards the future.* We believe that the approach to achieving sustainability is complex, difficult, but achievable through consolidated efforts at the level of society, which can be materialized through rational consumption, through effective activities to reduce the negative impact on the environment.

In order to create a sustainable university, it is necessary to reorganize the education system in order to insert the objectives related to sustainability in the daily activities of the universities, along with the integration of sustainability in the fields of research and education, which will focus on the training of skills linked to sustainability (Agheorghiesei, Asandului and Asandului 2020). They will help students to be more competitive in the labour market, but also to reach successful careers.

On the other hand, in order to cultivate sustainability within the institutions of the public health system, there is a need to integrate tangible activities to achieve sustainability in all departments of the institution, to reorganize the public health system in order to achieve sustainability. Thus, a series of activities could be carried out in the public health system, such as: making sustainable purchases, training employees in the direction of sustainability, promoting the culture of sustainability within medical institutions, etc.

In this context, a sustainable medical institution is that institution that harmoniously integrates concerns regarding the achievement of sustainability, in order to achieve economic-social-environmental balance in its activity, through a sustainability management capitalized within the institution.

On the other hand, a sustainable university is the university that harmoniously combines education, research through a complex process of ensuring an interdisciplinary balance in the context of the optimal use of the natural environment, ensuring social equity and economic well-being by achieving a collaboration with the stakeholders involved in this process.

Analyzing the university centers in Romania, we can mention that within the content of the curricula there are disciplines related to the achievement of sustainability objectives. Teodoreanu (2014) in his work, “Sustainable business

education – a Romanian perspective,” carried out an investigation through the prism of which he conducted a screening of the programs and course units, of the curricular situation regarding sustainable education in Romania (Teodoreanu, 2014, pp. 706-711).

The synthetic data presented by Teodoreanu (2014), in his work, are reproduced in Table 1. From the data in the table, it follows that in all university centers there are several course units on the topic of sustainability: “Environmental Management”, “Business Ethics”, “Strategic Management” and “Quality Management”.

Table 1. The curricular situation of sustainable education in university centers in Romania

Topics	University centers				
	Bucharest	Cluj-Napoca	Iasi	Brasov	Constanta
Environmental Management	x	x	x	x	x
Environmental Economics			x		
Environmental Law		x			x
Ecology	x	x		x	
Sustainable Development		x			
Sustainability					
Business Ethics	x	x	x	x	x
CSR (Social Responsibility)					
Entrepreneurship and Innovation	x	x	x	x	
Strategic Management	x	x	x	x	x
Quality Management	x	x	x	x	x
Intercultural Management	x		x		
Community Management					

Source: Teodoreanu (2014)

At the same time, we can note that only in some university centers there are such courses as: “Environmental Economics” – this course unit is present at the university centers in Iasi; “Sustainable Development”, found in Cluj-Napoca and “Intercultural Management” in Iasi and Bucharest. At the same time, some courses such as “Sustainability”, “CSR”, “Community Management” are not present in any university center.

In this sense, it is necessary to carry out a screening of the thematic contents, of the course units focused on sustainability present in the study programs, within the university centers of *Alecu Russo* State University of Balti, the Academy of

Economic Studies of Moldova, the State University of Moldova, Technical University of Moldova, *Bogdan Petriceicu Hasdeu* State University. In Table 2, the result of the screening, of the curricular situation regarding the emergence of sustainable education in the university centers of the Republic of Moldova is presented. Analyzing the curricular situation in the most important university centers in the Republic of Moldova, we specify that in all higher education institutions there are course units such as: Quality Management, Strategic Management, Business Ethics/Professional Ethics.

At the same time, some courses such as “Environmental Management” are not found in the ASEM curricula, while in the other higher education institutions it is present.

Table 2. The curricular situation of sustainable education in the university centers of the Republic of Moldova

Topics	University centers				
Specific courses	ASEM	USARB	USM	UTM	USCH
Environmental Management		X	X	X	X
Environmental Economics					
Environmental Law		X			
Ecology		X	X		
Sustainable Development				X	
Sustainability (Sustainable Development Management)	X				
Business Ethics/ Professional Ethics	X	X	X	X	X
CSR (Social Responsibility)	X		X		
Entrepreneurship and Innovation	X		X	X	X
Strategic Management	X	X	X	X	X
Quality Management	X	X	X	X	X
Intercultural Management	X		X		
Community Management					

Source: elaborated by the author

It should be noted that, due to a broader educational offer in other universities, this course unit can be found under the “Ecology” specialty at USARB, USM, USCH. At the same time, at UTM this unit can be found in the specialties related to “Energy”.

The “Ecology” course unit is only found at USARB and USM. The course unit “Environmental Law” is only found within the USARB institution of higher education.

In addition to this, we can mention that the course unit “CSR” can be found within ASEM and USM universities in the study plans and study programs of students’ training in the field of economics.

At the same time, the course unit “Entrepreneurship and Innovation” can be found in the study plans of students from economic specialties within the mentioned universities, with course units such as “Entrepreneurship” and “Innovation Management” within ASEM, USM, UTM, USCH, USARB. It should be noted that, within the USARB, the course unit “Entrepreneurship” is not included in the study programs of students majoring in economics.

In addition, the course unit “Intercultural Management” is included in the study plans of students trained in the economic field only within ASEM and USM, in the 2nd study cycle, i.e., master’s studies.

We must point out that the course unit “Sustainable Development” is a course unit included in the training of master’s students at UTM.

It should also be mentioned that only within ASEM the course “Sustainable Development Management” is included in the education plans for students in the 2nd cycle – master’s studies, where the SDGs are addressed, but also the need to connect the business environment, higher education institutions to the Sustainable Development Goals. At the same time, such course units as “Community Management”, “Environmental Economics” are not included in the educational plans of the universities offered for analysis.

Thus, following the analysis carried out, we can reiterate that the universities must evaluate their didactic process, but also the structure of the education plans in order to include in the education plans the course units that would help to train and substantiate sustainability skills in order to achieve the Objectives of Sustainable Development. We consider it necessary to include the following course units: “Sustainability”/ “Sustainable Development Management” in the training of future specialists from economic, energy, etc. study programs. At the same time, we propose the implementation of the “CSR” course unit with a preponderance in economic study programs, which would help future specialists to be aware of the need to demonstrate ethical behavior towards all market stakeholders.

In order to achieve sustainability in higher education institutions as well as those in the public health system, it is necessary to apply the institution’s Sustainable Development Model, which includes a series of stages in order to anchor institutions on the path of sustainable development.

In our opinion, we propose higher education institutions as well as those in the public health system, to follow several stages, in order to implement the Sustainable Development Model:

1. *Appointing a sustainability committee* – in our opinion, a first step in achieving sustainability within higher education institutions and within public health institutions is the appointment of a sustainability committee consisting of

3-4 members responsible for following the principles, carrying out measures to achieve sustainability in general, but also at the level of faculties/departments, departments/sections.

2. *Elaboration of the sustainability strategy within the higher education institution/medical institution* – we believe that the next step in achieving sustainability within higher education institutions and within medical institutions is the development of the strategy for achieving sustainability, which is a document developed by the sustainability committee and presents the approach of the higher education institution in cultivating, assuming and respecting strategic objectives of achieving sustainability. We also propose that the strategy to achieve sustainability should contribute to the creation of sustainable institutions, focused on the correct and efficient exploitation of human potential, on the creation of a green campus, but also on the foundation of a culture of sustainability. In our opinion, local, regional, national, international cooperation and collaboration is the key to success in creating sustainable institutions.

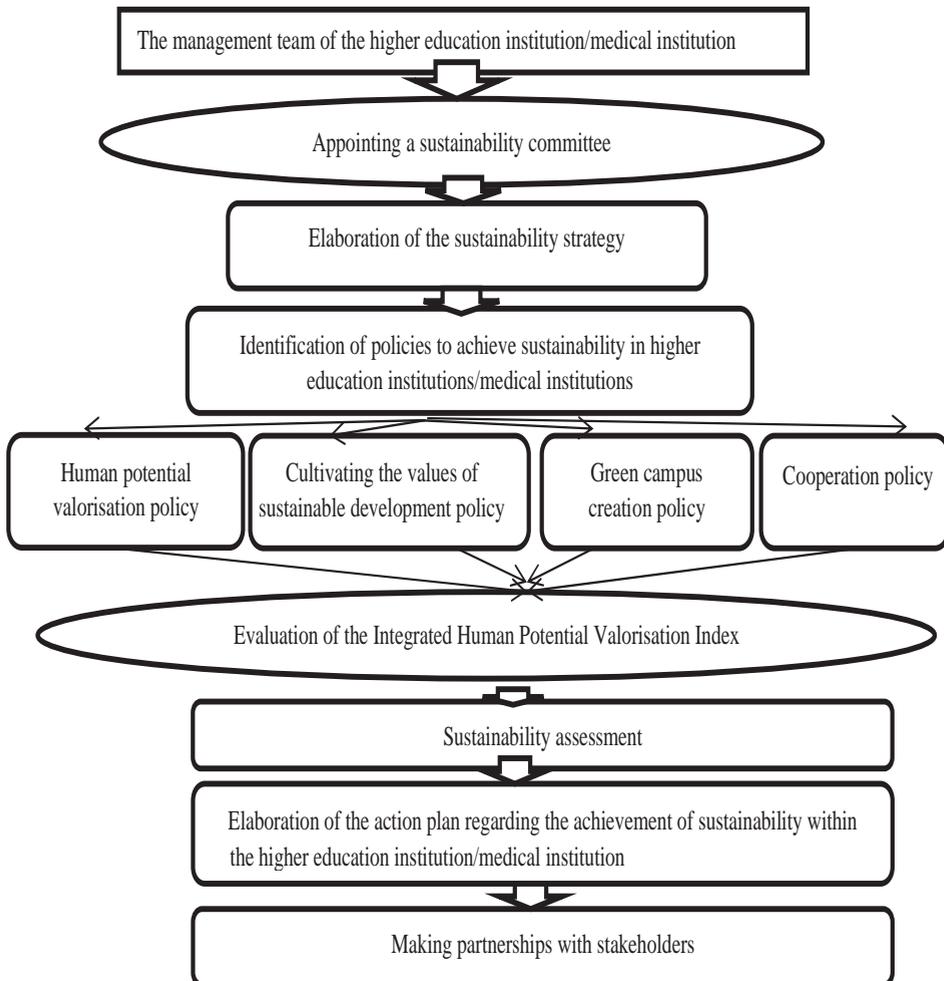
3. *Identifying policies to create sustainable institutions* – the next step in achieving sustainability is the development of policies to achieve sustainability, for each of the 3 components of university sustainability: ecological security, economic well-being, social equity. In our opinion, the policies must be focused on the basic components of achieving sustainability: the policy of valorization on human potential, the policy of cultivating the values of sustainable development, the policy of creating the green campus, the policy of reanimating cooperation in achieving sustainability.

4. *Evaluation of the Integrated Human Potential Valorization Index* – in our opinion, the next step in achieving university sustainability is the evaluation of the Integrated Human Potential Valorization Index, where the institution, applying the methodology proposed by us in the evaluation of human potential, will be able to identify the degree of valorization of human potential at the institution level, but also the problems, the challenges they face in this regard. At the same time, it will be possible to elucidate the necessary measures to increase the efficiency of capitalizing on human potential at the institution level.

5. *Assessing the sustainability of the institution* – we believe that the next step in achieving sustainability is the application of the model proposed by us in the assessment of sustainability, which, in our opinion, will guide the institution towards the assessment of the institution's sustainability, will help to identify the indicators in which the institution is positioned more deficiently and which require an urgent resuscitation. At the same time, the calculation of the Institution's Sustainability Evaluation Index will provide the opportunity to elucidate the urgent measures that must be applied both at the institution level, in general, and at the faculty/department, chair/sections level, in particular.

6. *Elaboration of the action plan* – the action plan to achieve sustainable development must include every actor and stakeholder that can help the institution

to achieve sustainability. Thus, the action plan will be focused on identifying the real actions that must be carried out by each individual employee/teacher, researcher, student, on the one hand, but also tangible activities that must be carried out at the level of department/sections, faculty/department, university/medical institution. A special place will also be given to the stakeholders of the higher education institution, such as: colleges, high schools, NGOs, the business environment, public sector institutions, mass media, international institutions, which will be able to contribute to sustainable development.



Source: elaborated by the author

Figure 1. Implementation of the Sustainable Development Model applicable in higher education institutions and those in the public health system

7. *Ratification of local-national-international cooperation agreements in order to achieve sustainability* – the next step, in our opinion, is the ratification of agreements both with state institutions and those in the private sector, a measure that will help to improve the efficiency of achieving sustainability, on the one hand, but also to increase the insertion of students, the adaptation of education plans, the needs of entrepreneurs. We believe that, in this way, higher education institutions as well as institutions in the public health system will strengthen their relations with their stakeholders, concluding these agreements, and, at the same time, will obtain multiple benefits, which, from a strategic perspective, will contribute to the efficiency the development of institutions.

In our opinion, focusing on the principles of achieving sustainability, assuming values, implementing tangible measures, will help higher education institutions as well as those in the medical system to step firmly on the path of sustainability, in the context of expanding partnerships, which will contribute to achieving sustainability of the whole society.

In the 21st century, a sustainable society is a socially, economically, environmentally, and educationally responsible society, contributing to the balancing of resource consumption and the efficiency of its development in the context of sustainability. We believe that universities, as “pumping engines of values in society”, will reanimate the system, infiltrate new responsibilities and principles, establish a new vision of the university of the future and build a viable society with equal opportunities for everyone, but and with multiple benefits for every citizen.

3. CONCLUSIONS

Following the study carried out by us, we presented the main conclusions and recommendations of the performed investigation, evaluating the sustainability of higher education institutions (ASEM, USARB, USM, USCH, UAIC).

We believe that a weak point that we have identified in all four evaluated higher education institutions is the lack of a sustainability strategy, which is becoming an imperative for sustainable higher education institutions. Thus, we believe that each higher education institution must develop a sustainability strategy, based on which to identify its approach to achieving sustainability through tangible, effective measures, periodically evaluated, by implementing university sustainability management, by involving to all stakeholders, along with the awareness of partners in order to achieve sustainability.

Another suggestion, as a result of the study carried out, is the inclusion in the curriculum of course units on the topic of sustainability (Sustainable Development Management /Sustainability) which would help cultivate sustainability skills among students. From the beginning, this course can be introduced to students from economics, law, pedagogy programs, with the possibility of extension to

other specialties, in the 2nd study cycle – master’s studies. Later, these courses can also be included for students from the 1st cycle – undergraduate studies.

On the other hand, it would be beneficial to introduce more learning units on the topic of sustainability, to students from economic specialties, and law. It will help sensitize students on the need to ensure sustainability in the production/service delivery process, business management. Students must understand that it would be good for the businesses managed/opened by them to have a sustainability department, which would be concerned with ensuring/connecting the economic unit to the achievement of the Sustainable Development Objectives. On the other hand, students must understand the need for cooperation in terms of achieving sustainability, making sustainable purchases, the need to save resources, use renewable energy sources, etc. To cultivate these competencies in students, it is necessary to increase the learning units related to sustainability.

Table 3. Conclusions and recommendations following the sustainability assessment study of ASEM, USARB, USM, USCH, UAIC

Conclusions	Recommendations
The universities of the Republic of Moldova register an average level of sustainability	Appointment of a Sustainability Committee (committees to achieve sustainability) that would deal with sustainability management within the higher education institution.
The universities of the Republic of Moldova focus more on the economic dimension of sustainability, to the detriment of the other dimensions	Balancing concerns of achieving sustainability across all four dimensions.
All analyzed universities do not have a sustainability strategy	Elaboration of a sustainability strategy (action plan).
All the analyzed universities do not have a section dedicated to sustainability on the institution’s website	Allocating a section to sustainability on the website of the higher education institution.
Moldovan universities show poorly directed concerns about achieving sustainability	Intensification and publication on the website of the efforts, concerns of the universities regarding the achievement of sustainability.
Moldovan universities have very few courses and course units on the topic of sustainability	The inclusion, in study plans, of course units/learning units focused on achieving sustainability.
Moldovan universities access few projects on the dimension of sustainability	Intensification of the submission of projects on the topic of sustainability.

Conclusions	Recommendations
Moldovan teachers publish a small number of articles on the topic of sustainability	Increasing the number of published articles, monographs, course materials on the topic of sustainability developed by university students from the Republic of Moldova.
Moldovan universities have a small number of collaboration agreements with the business environment on the dimension of sustainability	Ratification of agreements with the business environment regarding the promotion of student practice (in the sustainability department), regarding the organization of joint scientific events on the topic of sustainability.
Moldovan universities pay the least attention to the environmental dimension of sustainability	There is a strong need for greening the university campus, involving students in cleaning the environment, but also saving resources (installing LED bulbs with sensors, reducing water consumption by water flow reduction, etc.). The classrooms should be lit using 2-3 switches that would provide the possibility to connect electricity to certain areas (in the country, in the hall), thus saving electricity. This system is already operational within the USARB. At the same time, there is a need to collect waste separately (paper, glass, plastic) and recycle it.

Source: elaborated by the author

At the same time, another imperative is the consolidation of research on the topic of sustainability, thus, based on the study, we noticed little concerns of the university students from the Republic of Moldova on the dimension of sustainability. However, we believe that by raising public awareness of the need to achieve sustainability, we will be able to make progress.

In addition to the above recommendations, there is a need for both universities and medical institutions to implement the Sustainable Development Model that will help institutions to anchor all their activities in order to achieve institutional sustainability.

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THEORETICAL AND JURISPRUDENTIAL ASPECTS IN THE MATTER OF INSURANCE MEASURES IN CRIMINAL PROCEEDINGS - ECHR PRACTICE

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Abstract

The taking of protective measures in the criminal process is allowed in order to repair the damage caused by the crime, in order to special confiscation and to guarantee the execution of the fine, as well as to guarantee the execution of judicial expenses. Most of the crimes committed are resulting crimes, that is, crimes that generate material or moral damages. According to the legal provisions in the matter, reparation of the damage is done in kind (restitution of things, restoration of the situation prior to the commission of the crime, etc.) or by paying monetary compensation, if reparation in kind is not possible. The Romanian legislator explicitly regulates the conditions for obtaining, maintaining, revoking and replacing them, but in the internal practice of judicial bodies we have reported violations of internal legal provisions, as well as a non-compliance with those pronounced by the European Court of Human Rights in the matter. Through this study, we aim to show jurists, but also legal practitioners, those concrete situations in which either the prosecutor or the court failed to comply with the legal provisions, thus violating the rights established by law for the suspect or defendant, the civilly responsible party or other persons. In this sense, we will present aspects of internal practice, but also ECHR practice.

Keywords: *insurance measures; criminal process; reparation of damages; crime; European Court of Human Rights.*

JEL Classification: K 31.

1. INTRODUCTION

Any criminal trial, as an activity organized for the purpose of finding out the truth about the crime committed, implies a limitation of the rights of the suspect or defendant (as well as of other persons), a limitation that derives from the very status of suspect or defendant. Knowledge of the legal provisions and the exercise of procedural rights in good faith are guarantees of the execution of the judicial act without abuses and violations. As European citizens, we benefit from a double protection, through the legal provisions of an internal nature, depending on the citizenship granted to each one, but also a European protection, through the legal provisions of an international nature applicable in the matter.

In this sense, both the legal provisions in the matter must be respected, as well as a proportionality between the purpose of the criminal process and the rights of the persons involved in the criminal process. The situations reported in this study indicate, on the part of the judicial bodies, either a disregard for legality (Tatu, 2009) or proportionality (Talbure and Tatu, 2009) in the matter of security measures (criminal seizure, confiscation) and security measures (special confiscation, extended confiscation), which obviously harms the people whose rights were thus violated in the procedure of taking, maintaining, revoking and replacing these measures in the criminal process. We will present similar violations against people who are not parties to the criminal process, but whose rights were violated by making movable or immovable assets unavailable, although they do not have the status of suspect or defendant, as well as the internal practice and the practice of the ECHR in the matter, as points of reference.

2. METHODOLOGY

As the method used in the realization of this study, the theoretical information on the studied topic was used as an experimental framework, information that can be found in the legislative framework, as well as in the specialized literature, both domestically and internationally. In this way, the study has a fundamental character. In addition, the judicial practice in the matter was also researched internationally, so that the present study also has an applicative character. The study aims to show whether the national courts have respected the legal framework in the exercise of justice and whether the European courts have found violations of the provisions established by European legislation. Basically, if the rights of European citizens would be respected or violated. Aspects of the judicial practice of the European Court of Human Rights (ECHR) are presented (European Court of Human Rights, 2022).

3. THEORETICAL AND PRACTICAL ASPECTS

3.1. Safety measures

In terms of material law, the Romanian legislator enshrines in art. 107-112/1 Criminal Code the regime of safety measures, which are included in the scope of criminal law sanctions, along with punishments and educational measures, the purpose of safety measures being to remove certain conditions of danger and preventing the commission of the acts provided by the criminal law. (Tatu, 2016). The need for social defense has determined the introduction into the criminal law of some sanctions with a pronounced preventive character, which justify their presence in the criminal process due to situations that reveal a current danger, but also a danger for the future in which concerns the commission of another crime, beyond the dangerousness of the act committed. The following are security measures: compulsory medical treatment, medical hospitalization, prohibition of

occupying a position or exercising a profession, special confiscation and extended confiscation. Security measures are taken against persons who have committed unjustified acts provided for by the criminal law (art. 107 paragraph 2 Criminal Code), regardless of whether the act constitutes a crime or not and can be taken even if the perpetrator is not punished, except the measures provided for in art. 108 lit. d (special confiscation) and e (extended confiscation) and regardless of whether the perpetrator is an adult or a minor (Tatu, 2016).

Since they are included in the scope of criminal law sanctions, the security measures, like the punishment, also have a coercive character in the subsidiary, by restricting the freedom of the perpetrator or by affecting his property. Unlike punishments, safety measures are not consequences of criminal liability and do not depend on the seriousness of the committed act, they can be taken even if the perpetrator is not punished (art. 107 par. 3 Criminal Code), their taking being conditioned of the state of danger generating facts provided by the criminal law. (Tulbure and Tatu, 2003) The law establishes the states of danger that attract the taking of safety measures, possibly due to various causes: mental alienation, alcoholism, lack of professional training, possession of assets that can lead to the commission of a crime, etc. The danger is closely related to the person of the perpetrator, and the security measure is taken against the person of the perpetrator. It has been shown in the literature that the nature and seriousness of the state of danger will be taken into account, as well as the possibility of removing the danger. (Lupascu, 2019)

The law does not specify the period of time they can be taken, so they can be taken indefinitely, lasting as long as the state of danger exists (Theodoru and Chis, 2021) The termination of the state of danger determines the termination of the ordered safety measure. That is why the safety measures are not prescribed, being related to the existence of the state of danger. In the case of the crime competition, only one safety measure must be taken. If several safety measures of a special nature have been taken, they are cumulative. The conditional suspension of the execution of the sentence does not attract the suspension of security measures. (art. 98 para. 2 Criminal Code) Security measures can be taken in compliance with the standards of criminal procedure, in particular the presumption of innocence (Article 6 ECHR), the right to a fair trial and the requirement to prove a crime beyond any reasonable doubt (University of Bergen, 2023). The safety measures taken during a criminal trial will be found in the court decision according to art. 404 Criminal Procedure Code.

3.2. Insurance measures

In terms of procedural law, until the final settlement of a criminal case and until the final settlement of the civil action, but also with a view to taking security measures for special or extended confiscation, security measures can be taken during the criminal process. According to art. 249 paragraph 1 Criminal Procedure

Code, the prosecutor, during the criminal investigation, the preliminary chamber judge or the court, ex officio or at the request of the prosecutor, in the preliminary chamber procedure or during the trial, may take precautionary measures, by order or, after case, by reasoned conclusion, in order to avoid the concealment, destruction, alienation or evasion of the assets that may be subject to special confiscation or extended confiscation or that may serve to guarantee the execution of the fine or legal expenses or the repair of the damage caused by criminal offence. Only in the way of appeal can security measures be taken, (according to art. 250/1 Code of Criminal Procedure) not in the other ways of appeal, by closing, and not at the completion of the judgment of the appeal by sentence, since these are taken until the definitive stay of the court decision, by decision special confiscation or extended confiscation can be ordered.

The security measures consist in the unavailability of some movable or immovable goods, by imposing a seizure on them. If preventive measures are taken to guarantee the execution of the fine, they can only be ordered on the assets of the suspect or the defendant. If the security measures are taken with a view to special confiscation or extended confiscation, they can be taken on the assets of the suspect or the defendant or of other persons in the ownership or possession of which the assets to be confiscated are located. The insurance measures in order to repair the damage caused by the crime and to guarantee the execution of the legal expenses can be taken on the assets of the suspect or the defendant and the civilly responsible person, up to the concurrence of their probable value. (paragraph 5)

The precautionary measures provided for in paragraph 5 can be taken, during the criminal investigation, the preliminary chamber procedure and the trial, and at the request of the civil party. The precautionary measures taken ex officio by the judicial bodies provided for in paragraph (1) may also benefit the civil party. These precautionary measures taken under the conditions of paragraph (1) are mandatory in case the injured person is a person without exercise capacity or with limited exercise capacity. On the other hand, assets belonging to a public authority or institution or another person under public law cannot be seized, nor assets exempted by law.

As a guarantee of the principle of legality, but also of the opportunity to maintain insurance measures, the legislator provided in art. 250/2 Criminal Procedure Code as "throughout the criminal process, the prosecutor, the judge of the preliminary chamber or, as the case may be, the court periodically checks, but not later than 6 months during the criminal investigation, respectively one year during the trial, if the grounds exist that determined the taking or maintenance of the precautionary measure, ordering, as the case may be, the maintenance, restriction or extension of the ordered measure, respectively the lifting of the ordered measure, the provisions of art. 250 and 250¹ applying accordingly" (Criminal Procedure Code, 2010). These last articles refer to the possibility of filing an appeal against the insurance measures.

3.3. Violations - non-compliance with the regulations in the area of illegal measures

In order to better understand the institution of security and safety measures, we must analyze the conditions for taking and maintaining these measures during the criminal process, in order to know in each specific case if these conditions exist, otherwise they must be lifted immediately, all the more so as they can target not only the assets of the suspect or the defendant, but also of other people who are not involved in the criminal process. What we will analyze refers to the principle of the legality of the measures, as well as the opportunity. Ignoring them gives an illegal and groundless character to the measures taken, with major implications on a person's property, infringing the property right. (Udroiu, 2022) Unfortunately, judicial practice also reveals situations where the conditions for taking these measures did not exist, or they no longer existed during the criminal process.

Regarding the conditions of legality, it was appreciated (Lupașcu, 2023) that only from the moment when the alleged perpetrator of a crime has acquired the status of a suspect, it is possible to take the preventive measure, and not from the moment of the start of the criminal investigation in rem. It is normal for this to be the case, since the taking of security measures involves the administration of evidence and the assets of the suspect, the defendant, the civilly responsible party or other persons, an activity that requires the identification of the suspect and the other persons (EU Directive 2016/43 of the European Parliament). If it was ordered to carry out the further criminal investigation only for the crime of money laundering, without retaining any primary crime, the order by which preventive measures were taken is illegal. (idem)

Regarding the appropriateness of taking these measures, judicial practice is contradictory, precisely because the legislator does not oblige the judicial body to take or maintain security measures in every criminal trial, using the phrase "may take security measures" remaining at the discretion of each judicial body depending on the procedural phase in which the criminal case is located, to order in this sense. That is why, without sacrificing the purpose of the criminal process, prudence and balance must be shown between the procedural interests and those of the concerned persons against whom insurance measures can be taken, in compliance with art. 1 of Protocol 1 to the European Convention on Human Rights on the proportionality of the limitation of the right to property. According to this legal text, "any natural or legal person has the right to respect for his property. No one can be deprived of his property except for the cause of public utility and under the conditions provided by the law and the general principles of international law." The Constitution of Romania states in art. 53 the necessary and proportional nature of taking any measure within a democratic society, without discrimination and without prejudice to the existence of the right or freedom.

In judicial practice, the insuring measure of sequestration and confiscation of all assets of the defendants (Cluj Court, Cluj Court of Appeal) which can be subject to special confiscation and which can serve to guarantee the recovery of the damage caused to the state budget, was illegally ordered and maintained, and judicial expenses, as well as on assets belonging to other persons that may be subject to extended confiscation, although art. 249 of the Criminal Procedure Code states that these measures can be taken on some movable assets, their illegal nature being shown. If all the assets of the suspect or the defendant or the civilly responsible party were to be ordered, it would mean assuming that all the assets acquired by a natural or legal person would be illegal, thus operating the presumption of illegality. The Constitution of Romania (2003) presumes the lawful character of the acquired wealth, which substantiates the defenses for the lifting of seizures ordered in order to confiscate the assets of persons who do not have the capacity of parties in the criminal process. The presumption being a relative one, it can be overturned if the evidence proves that the third parties acquired these goods by committing acts provided by the criminal law, the judicial bodies being able to request proof of the manner in which they came into possession of the goods.

Also, we found the illegal character, but also unfounded, of the prosecutor's orders, since they are not motivated in fact, which restricts the right to defense and violates the right to a fair trial, but also the principle of the presumption of innocence under the civil aspect, the order being issued with the violation Art. 4 and 8 Criminal Procedure Code. Any ordinance must include the reasons on which it is based, so that the interested party, taking note of the reasons that were its basis, can challenge it. Only in these coordinates the right to defense can be effectively exercised. In many situations, the sequence of procedural documents that make up the criminal process is mainly presented, respectively: the initiation of the criminal prosecution, in rem or in personam, the continuation of the criminal prosecution, the extension of the criminal prosecution, the extension of the criminal action, etc., which obviously does not provide content in the sense of a true "motivations" of the contested ordinance. In these conditions, it is not possible to formulate a tailor-made defense, this being almost formal. Practically, it equates to a lack of defense. Only through an effective defense, the parties can benefit from a fair trial.

In the case of the commission of resulting crimes, such as tax evasion, the prosecutor's orders do not develop in a broken-down manner for each defendant how the damage created was calculated, by showing an amount in a determined amount for each defendant, the amounts being kept in common by all the defendants. We deduce from the contested ordinance that all the defendants had the same criminal activity, drawn to indigo, without the ordinance distinguishing for each of them. The ordinance is not motivated in terms of the degree of

involvement and the form of participation in which the defendants did it, respectively authorship, co-authorship, instigation, complicity.

Regarding the third parties against whom the insuring measure of seizure was ordered by making available some movable or immovable property, the administered evidence should have revealed the fact that the third parties are interposed persons with the help of which the defendants used the money resulting from the criminal activity (tax evasion, forgeries). Committing one of the crimes provided by art. 112/1 para. 1 Criminal Code does not automatically lead to the taking of insurance measures on assets belonging to persons who are third parties to the commission of one of these crimes, because this would only involve a cold and implacable mathematical calculation, the magistrate who ordered the measure being nothing more than an instrument that he will not be able to form his own opinion, or the criminal law has a completely different purpose and connotations, as well as the magistrate who applies it. The fact that the defendant drove a car that is registered in the name of another person does not justify ordering the seizure of that car.

Although the date of acquisition of each good by the indicated owner must be shown, so that in this way it can be checked whether the goods on which insurance measures have been instituted can form the object of extended confiscation, this is not done exactly. According to the Decision of the Constitutional Court no. 11/2015 published in the Official Gazette no. 102/9 February 2015, if the insurance measure is taken with a view to extended confiscation, it does not apply to assets acquired before the entry into force of Law no. 63/2012 amending the old, but also the new Penal Code, respectively April 22, 2012. Since the date of acquisition of the assets on which the insurance measure was ordered has not been established with accuracy, the rule provided by paragraph 8 art. 112/1 of the Criminal Code, according to which "the confiscation cannot exceed the value of the assets acquired in the previous period. of paragraph 2, respectively of 5 years prior to the conviction, which exceed the level of the lawful income of the convicted person.

Also, the legal conditions for taking insurance measures are not met even when there is no evidence of the transfer of assets by suspects/defendants or third parties to a family member or a legal entity over which the defendants have control, according to art. 112/1 paragraph 3 Criminal Code. In order for this provision to operate, the assets should have been owned by the defendants/third parties, and subsequently, in order to evade the payment of possible compensation in the event that they are found guilty, these assets should have been moved, transferred, by concluding new transferable property deeds in the name of other people, relatives, friends, etc. Regarding third parties, it is obvious that they should have an agreement prior to the conclusion of a property transfer deed with the suspects/defendants who will later become convicted, which is not proven by any means of evidence in the present case.

The reasoning consisted in the fact that from the administered evidence it resulted that "even though the goods appear in the names of third parties - in family relationships, as well as close friends of the suspects, they are owned by the defendants", although the existence of a family relationship /friendship is not included among the legal conditions for taking measures, the measures being taken in violation of the right to private property. It would mean that any goods belonging to relatives, friends or acquaintances could be subject to insurance measures, without limits, which is obviously unthinkable.

In order to be able to order the insurance seizure measure on assets whose owners are other people than the defendant, it is necessary that the conclusion of such contracts is done for the purpose of defrauding the law. (Mateut, 2019) From this perspective, it means that both the defendants and the people who entered the contest, i.e. the current owners of the goods, acted with direct intent, the purpose being a determined and illegal one, that of defrauding the law, through the support given to the defendants to evade the payment of civil compensations, in the event of their civil liability. In this sense, the existence of a fraudulent intention of third parties must be established, which had to exist at the time of the conclusion of the sales-purchase contracts or other transferable property titles.

Seizures are also ordered on all jewelry and watches found during the home search, in violation of the provisions of art. 935 Civil Code, text that regulates the acquisition of the right of movable property through good faith possession. Although the evidence showed that some of them belong to the defendant's wife and children, who are bona fide possessors, some being inherited from generation to generation, and others received as a gift, the measure of seizure was not lifted, so the measure is illegal. In practice, it was decided that the seizure that ensures a patrimonial sanction is illegal if it is applied to the defendant's wife's own assets (The Supreme Court, Decision no. 3047/1973). For common sense, it does not apply to the defendant's children's own assets either. Then, the measure of sequestration was ordered on some sums of money of various commercial companies, although part of them were intended for the current activity, payments of social insurance contributions on the account of the states, taxes on salaries, etc., the criminal investigation bodies assuming obviously illegal that all the sums of money are the result of criminal activities.

In this regard, Directive 2014/42/EU on the freezing and confiscation of instruments and products of crimes committed in the European Union provides in art. 8 as guarantees: "Third parties have the right to claim a property title or other real rights, including in the cases mentioned in article 6. Consideration no. 33 of Directive 2014/42/EU. According to him, it is necessary to provide for specific safeguards and remedies to also guarantee respect for the fundamental rights of third parties who are not subject to criminal prosecution. It further states that these guarantees include the right to be heard for third parties who claim to be the owners of the seized property.

Also, in the case of *Agosi v. the United Kingdom* (application no. 9118/80, series A, no. 108, ECtHR Judgment of October 24, 1986), it is stated: "For confiscation under Article 1(2) of Additional Protocol to the Convention, it is sufficient that the state has maintained a balance between the public interests and those of the person concerned [...]. Maintaining a balance depends on numerous factors; in this sense, the behavior of the property owner, including the degree of culpability or diligence that he has shown, is only one element of the many circumstances that must be taken into account. Consequently, even if Article 1(2) does not contain any explicit procedural requirement, the [ECtHR] must consider whether the procedures applicable in the case allow, *inter alia*, adequate consideration of the degree of culpability or diligence of the applicant company or, at least, the relationship between the company's conduct and the crime [...]. It is also necessary to establish whether the procedures in question offered the applicant company an adequate opportunity to support its point of view before the competent authorities". (Summary of the preliminary ruling request - Case C-393/19).

In the case of *Silickiene against Lithuania* and in similar cases (*Case of Sporrang and Lonroth against Sweden*, *Case of Weissman and others against Romania*, Judgment of February 12, 2013 pronounced in the *Case of Dzugayeva against Russia*, *Case of Jahn and others against Germany*) it is stated that: "in regarding the ratio of proportionality between the purpose of confiscation and the fundamental rights of the petitioner, the European Court of Human Rights reiterates the idea that in the case of confiscation of properties the fair balance between purpose and rights depends on many factors, including the behavior of the owner, national courts having to evaluate the degree of involvement of the owner or at least the relationship between his behavior and the crimes committed. (*Case of Ünspekd against Bulgaria*, 2015)

4. CONCLUSIONS

Through this study, we tried to review the theoretical aspects, but also the domestic and international practice, in the matter of insurance measures and safety measures taken in the criminal process. The situations shown are aimed at sensitizing the theoreticians and practitioners in the matter, so that in the future we will no longer be in the presence of situations in which the fundamental rights of the people involved in criminal trials have been violated, or that there will be as few such situations as possible. The analyzed examples are part of a multitude of other examples. There are many situations in which national courts respect the framework provisions in the matter.

The purpose of the article is to make a relevant analysis between the internal provisions regarding insurance measures and security measures regulated by domestic law and the provisions of the ECHR, so implicitly we analyzed the rights of European citizens, but also the cases of non-compliance with the framework

provisions in the analyzed matter. The analyzed principles, whether it is legality, opportunity or proportionality, the right to a fair trial, the presumption of innocence, the right to defence, were subjected to analysis against the decisions handed down by the European Court of Human Rights, an international body empowered precisely to identify those situations where the law has been violated and therefore our rights.

As can be seen, not only the Romanian courts have issued solutions contrary to the provisions of the European Convention on Human Rights, but also the courts of other countries. This prompts each one of us to a continuous improvement, to a thorough knowledge of the domestic and European legislation, so that illegal decisions are no longer pronounced. Of course, the current study is only a presentation of the most current problems, certainly there are others, which will probably be pointed out by other authors in their articles and studies.

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THE ACCOUNTING JOB – END OR A NEW BEGINNING?

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Abstract

The World Economic Forum launched on May 3, 2023, the "Future of Jobs Report" which, based on a study applied to 803 representative companies from 45 economies, brings to analysis some shocking data regarding the evolution of the job market at global level. Thus, a simple arithmetic shows that the volume of 69 million new jobs predicted to be created in the next five years is dwarfed by the loss of 83 million positions, thus resulting in a disappearance of 14 million jobs. Motivated by the fact that Accounting, bookkeeping, and payroll clerks are among the most affected fields, the article analyzes the current position of this field of activity in relation to the new digital transformations and seeks to identify survival niches. In this sense, the needs of professional training are identified as well as how the process automations generated by digitization and AI can lead to the total or partial reinvention of the accounting profession.

Keywords: *Artificial Intelligence; data analysis; digitalization.*

JEL Classification: M1, M2, M4, O3.

1. INTRODUCTION

The economic and social impact as well as the development prospects of the technologies involved make "digitalization" a ubiquitous term, with impact in vast geographical areas and having complex applicability. The concept is often perceived and used as a synonym for "digitization", but the two notions require a clear dissociation: "digitization" is a technical process of converting data from analog to digital bits, while "digitalization" refers to a increased use of digital and IT technologies at work (Dabic *et al.*, 2023). Simple "computerization" at the level of company, institution, region, etc. it is replaced by a complex of technologies and work procedures that lead to transformations and reconfigurations of the economy and work, at the macro level.

Defining "digitalization" is not exactly an easy task, this fact being due to the multiple implications of the notion and the increasingly varied fields of application. Academia defines digitization through digital communication and the impact that digital media has on contemporary social life (Brennen and Kriess, 2016). Thus, the notion is synonymous with a strategy or process that goes beyond the implementation of technology to generate profound and fundamental

transformations of business models and the evolution of professions. The Gartner Group sees digitalization as “the use of digital technologies to change a business model and provide new opportunities for revenue and value creation; it is the process of moving to a digital business”. Digital transformation is more about people and less about technology, as it is management-driven organizational change due to radical challenges to corporate culture and the leverage of technologies that empower and assist employees. In the broad and complex context of digitalization, the automation of office work derives from the need for cost reduction, operational efficiency, relinquishment of stacks of papers and, finally, superior utilization of available human resource skills.

Although digitalization facilitates access to innovation, technologies and knowledge, the potential risks and threats to human resources are becoming more apparent. The emergence of the computer and the Internet caused new dilemmas in the world economic landscape, which led, in 1983, the Nobel Prize laureate, Wassily Leontief, to bet on the gradual diminishing of the role of the most important factor of production, namely, the human resource in as happened with the disappearance of horses in agriculture, being replaced by tractors (Leontief, 1983). The theory that technology is a major cause of job loss has been challenged, however, by a broad spectrum of economists who believe that automation and other forms of technological progress create more jobs than they eliminate. Apparently, the reasoning is simple: reducing production costs leads to lower prices and, implicitly, to increased demand; in a competitive market, technological changes have the effect of increasing production which requires more labor, thus compensating for the reduction of human resource expenditure per unit of product (Brynjolfsson and McAfee, 2014).

The accelerated pace of digitalization in recent years, the regional specificity in the broad spectrum of globalization, the complexity of automation implications in different fields or branches of economic activity, however, call for a more careful analysis of the perspectives of work as a factor of production, work through the lens of particular aspects, beyond the aforementioned general self-regulation mechanisms. In recent years, consistent signals have been sent to analysts and policy makers regarding the adverse effects of intelligent information technologies, especially on the risk of unemployment. Such a warning comes from Frey and Osborne (2013) who, based on a machine-learning algorithm developed at Oxford University, conclude that 47% of jobs in the USA are at risk of being automated in the next 20 years (Nedelkoska and Quintini, 2018). Elon Musk warned in 2017, at a World Government Summit in Dubai, about mass unemployment that will be a real social challenge due to the sharp reduction in the number of jobs that will not be affected by robotization, and Bill Gates even proposes the taxation of automated work (Larson, 2017). The reports of the World Economic Forum, respectively The Future of Jobs Report, indicate, in recent years, the fact that activities based on routine, which require average training,

accountants, payroll clerks and auditors will be less sought after in the future. The ACCA (Association of Chartered Certified Accountants) study, carried out in 2020 on the future configuration of the labor market, shows a trend of reinventing jobs in which the human factor combines traditional methods with new technologies that will have a significant impact in the next three years, giving a pronounced digital and multi-disciplinary character to positions in the field of financial-accounting processing (ACCA, 2020).

The changes brought about by digitalization lead to resizing of the contribution of the human factor, by relieving repetitive and time-consuming operations, leaving room for creativity, professional reasoning or even the involvement of a specific sensitive or emotional side. However, the foreshadowed changes can negatively influence the perception of new work tools for several reasons: fear of unemployment, insufficient professional training, incomplete information on smart technologies, etc.

2. RESEARCH JUSTIFICATION

The latest report issued by the World Economic Forum predicts for the next 5 years (2023 – 2027) the evolution of jobs from which the article notes two antagonistic trends:

- The category of jobs with *upward evolution*, of which agricultural equipment operators, heavy truck and bus drivers, vocational education teachers are on the first places.
- The category of jobs with *downward evolution*, of which on the first three places we find data entry operators clerks, executive and administrative secretaries, accounting, bookkeeping, and payroll clerks.

As for the last three categories of jobs, they total half of the total number of jobs threatened with extinction, according to the study. The table below (Table 1) presents a preliminary analysis of the candidate profile for these jobs, with the aim of identifying several common elements that have turned these jobs into prime targets of global digitalization:

Table 1. Particularities of the jobs that will be affected by digitalization in the period 2023 – 2027

Responsibilities	Skills and qualifications required	Common elements
<i>Data entry clerks</i>		
Completing and updating databases. Data review, detection of redundancies and errors, making corrections.	High school diploma or equivalent. Data entry experience. Excellent written and verbal communication skills.	Significant volume of routine, repetitive and generally rule-based operations.

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Responsibilities	Skills and qualifications required	Common elements
Generating specific reports, storing results in the database, and performing backups. Scan and print files on demand.	Ability to type quickly and accurately. Knowledge of operating spreadsheets and online forms. Ability to keep company information confidential.	Emphasis on preserving informational confidentiality. Generating and disseminating reports to the organizational levels concerned. The need for fast and error-free dissemination of information.
<i>Executive and administrative secretaries</i>		
Answering and directing calls. Carrying out reception formalities. Managing calendars. Making travel arrangements. Participation in meetings, preparation of minutes. Maintaining office inventory. Dissemination of memos, reports, etc. to relevant colleagues.	Time management and organizing skills. Communication skills, including with all levels of employees, vendors and customers or guests. Professional writing skills, including emails, memos, letters, etc. Good computer skills, familiarity with word processors, spreadsheets, document sharing and presentation skills.	
<i>Accounting, bookkeeping and payroll clerks</i>		
Transactions bookkeeping. Monthly closing of registers. Completing tax forms. Management of receivables and payables accounts, payrolls. Processing purchases and refunds for customers. Preparation of financial statements and records in accordance with regulations. Supporting quarterly tax estimates and annual returns. Supporting the establishment of the company's best practices related to accounting.	Attention to detail and record keeping skills. A good understanding of accounting and financial operations. Knowledge of accounting, invoicing software. Honesty and discretion in working with sensitive information. Ability to quickly perform calculations. Comfortable working with word processors and spreadsheets. Knowledge of standard accounting principles and best practices. Excellent written and verbal communication skills. Ability to maintain strict confidentiality of company financial information.	

Source: own projection based on data available in the Future of Jobs Report issued by the World Economic Forum (2023), and on www.linkedin.com, www.indeed.com

Having the defining elements that determined these jobs to be affected by the new conditions of current excessive technologization, the present study motivates its research starting from three pillars or working hypotheses:

H1. Personnel involved in accounting and payroll operations are directly affected by the trend of job reductions (this professional category appears on the 3rd place in the World Economic Forum analysis, but it is also noted that data-entry operators can have similar roles).

H2. Digitalization, especially process automation, has already changed the tools and work procedures of accounting professionals at different levels of expertise in terms of collecting, processing data, recording transactions, or generating reports.

H3. Disruptive technologies have caused displacement of human resources (especially medium-skilled) by saving a considerable number of working hours at the level of organizations.

3. METHODOLOGY

The study used, as the main working tool, beyond the exhaustive treatment of the specialized literature, the analysis of the effects of digitalization on the future of financial-accounting practice from several points of view:

- Dedicated digital technologies – offers, news, developments, market volatility of suppliers of such products.
- Case studies, practical examples – automation solutions successfully applied in the field of financial reporting, simultaneously with the highlighting of shortcomings and risks in the automation of financial-accounting data management processes.
- The current social and economic context – organizational culture, the need for professional retraining of human resources, constraints, and legislative changes.

The fact that digital technologies come with a particular dynamic and with a rather alert extension of applicability, the present analysis forces a certain rigor in the way of selecting the materials through the prism of the sources (they must be recognized and verifiable), the year of appearance (it emphasizes novelty), of content relevance (extraction of innovative ideas). Thus, the identification of data sources containing publications relevant to the topic resulted in electronic libraries such as IEEE, Science Direct – Elsevier, SpringerLink and Google Scholar. In addition, the bibliographic resources cited in the content of the articles thus identified were also taken into consideration and Google Scholar alerts were necessary to identify, during the writing of the present work, the news published about digitalization in accounting. The publications in English were studied, as a priority, by introducing in the search process expressions such as: "digitalization in accounting", "digitization in accounting", "cognitive process automation", "intelligent process automation", "digital technologies for financial reports".

The main objective of the research is to identify the prospects as well as the chances of survival of the accounting profession in the current context generated by the accelerated digitalization of specific processes. This approach is carried out by finding answers to the following questions:

Q1: What is the current state of engagement of digital technologies in accounting?

Q2: What challenges/problems have been solved by digitalization and the extent to which they have been met?

Q3: What are the main risks caused by digitalization for the accounting profession?

Q4: How can the risks identified in question number 3 be managed so that the profession of accountant has a future in terms of digitalization?

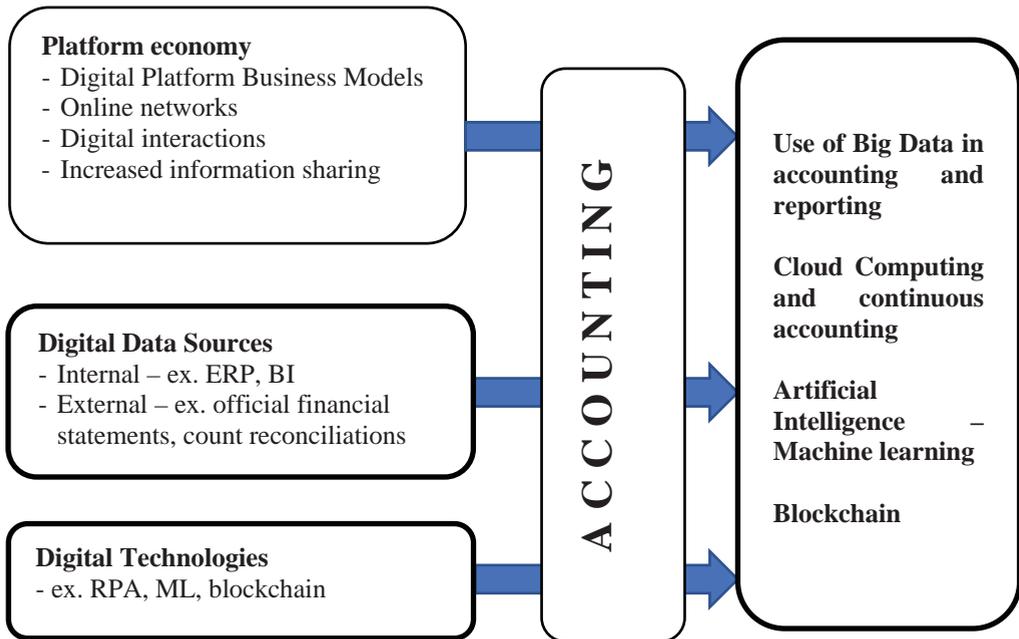
The answers obtained were treated with the aim of providing a complete picture of the contextual situation, to identify opportunities or realistic perspectives for the accounting profession and to suggest future research directions in the field of automation in the collection and processing of financial-accounting data.

4. DISCUSSIONS

4.1. The current state of digitalization involvement in accounting

In the last specific evolutionary stages, the accounting profession was organically linked to the advances made in the IT field, the literature speaking of two technological phases with an impact on organizations (Granlund and Mouritsen, 2003). The first phase was driven by computerized information systems specific to the 1960s and 1970s and allowed accountants to accurately record data as well as perform analyzes at a higher level of detail. The second phase was facilitated by the emergence and expansion of the World Wide Web and integrated information systems in the late 1990s and early 2000s. Enterprise Resource Planning (ERP) systems have been emblematic of transaction-oriented information systems that have allowed accountants to process information in a different and much more efficient manner (Knudsen, 2020). The third phase is well underway and is known collectively as "digitalization" and in which technologies are transforming and expanding the sources and types of data processed by accountants. Digitalization plays a double role: on the one hand, it creates new platforms for conducting business (e.g. e-commerce), radically transforms the availability of data (intangible format, available online and in real time), creates security risks (the multitude of data and information requires filtering and access monitoring) or determines new regulations from authorized bodies (new financial reporting format, e.g. Electronic Single European Format – ESEF, starting in 2020); on the other hand, the same technologies provide the solutions for the accounting activity to perform in the new conditions.

Technological innovations and online connectivity have created the premises of the so-called "platform economy", according to a 2019 Deloitte report that draws attention to the double impact of excessive digitization, namely, facilitating economic relations but also profoundly modifying processes and mechanisms within organizations (Chan *et al.*, 2019).



Source: own projection

Figure 1. Instruments generated by digitalization in accounting

Thus, the applicability of digital technologies in financial-accounting data processing works based on the new principles of openness and information sharing and has a strong impact on how companies consolidate their strategic plans (Gulin *et al.*, 2019). The role of the accounting professional is moving from simple data entry, transaction recording or simple analysis to strategic business consulting. The reason? Simple, routine, repetitive operations or operations that do not require additional human expertise are already successfully solved by automation (e.g., Robotic Process Automation - RPA), management requesting predictive analytics, consulting, strategic information in real time.

4.2. Problem solving through digitalization

Therefore, the technologies that have found application in the financial-accounting field have responded to some desires regarding how organizations

understand to respond to current challenges. Analysis of the offers of the most well-known software solution providers in the field, the motivations underlying the digitalization of financial-accounting processes, starting from the need to increase work speed, removing paper support, and going up to complex, error-free and high-quality analyzes high addressability (Gulin *et al.*, 2019).

Table 2. Digital solutions for accounting challenges

Adresability	Digital solution	Provider	Documentation source
Monitoring and payments	Cloud-based software applications with the ability to eliminate manual data entry	Xero	www.xero.com
Financial reporting	Data collection, automatic generation of Trial Balance, Profit and Loss Account, Cash Flow Report	Oracle NetSuite FreshBooks Quickbooks Online	www.oracle.com/erp/ www.freshbooks.com www.quickbooks.intuit.com
Bank feed	Automatically download incoming and outgoing transactions from bank account to accounting software	Oracle NetSuite FreshBooks	www.oracle.com/erp/ www.freshbooks.com
Data visualisation, internal reporting	Dynamic and customizable dashboards, with real-time visualization of key values: cash flow, profit and loss, account balances, expenses, accounts payable and receivable, and sales.	Oracle NetSuite FreshBooks Zoho Books	www.oracle.com/erp/ www.freshbooks.com www.zoho.com
Data-entry, transaction registration, data collection, form filling	Automate repetitive, routine, and high-volume tasks.	Robotic Process Automation (RPA)	www.uipath.com www.blueprism.com
Accounts payable, accounts receivable	Software for automating accounts payable that can manage all payments in one central location, providing a clear picture of finances. Payments, approvals	Plooto	www.plooto.com

Adresability	Digital solution	Provider	Documentation source
	and reconciliation are unified under one dashboard		
Inventory Management	Digital tools to manage inventory at multiple locations, transfer inventory between locations in one click and manage barcodes	ZarMoney	www.zarmoney.com

Source: own projection based on offers from software solution providers dedicated to the financial-accounting field

4.3. Risks generated by the digitization of financial-accounting processes

Digitization frees accountants from a significant amount of redundant, routine tasks, allowing them to engage in more creative activities, e.g., consulting, or financial analysis (Herbert *et al.*, 2016). Strictly from the point of view of human resources, this transformation of work tools is perceived differently and provokes reactions depending on the position or role held within an organization:

- ✓ human operators replaced in the performance of routine and repetitive processes that require average training - they may show an attitude of resistance, skepticism, fears related to the prospect of unemployment or the need for professional retraining.
- ✓ management/shareholders – concerned with the return on investment in digital technologies, can allocate budget for expanding digitization to other sectors as well.
- ✓ Financial controllers and CFOs - start using structured data, unstructured data, and predictive analytics to access large base of customer information, financial trends, and industry information to make insightful forecasts.
- ✓ highly qualified staff – they are relieved of redundant, time-consuming tasks and are more involved in professional reasoning, consulting, etc., but need new skills in data analysis or the use of new IT tools.

The risks of digitization can be categorized, therefore, from the point of view of the level of impact, as follows: *risks perceived at a personal level* - by everyone, directly affected by the introduction of new technologies, and *risks perceived at an organizational level* - by management levels, departments involved, shareholding, etc.

The *risks perceived at the personal level* are determined by the training level of the human resource. Thus, for accountants with an average qualification and who carry out activities that do not involve a high level of expertise or analytical thinking skills, they may face the *risk of job loss* or *professional non-compliance*

determined by a substantial change in the required duties and skills through the job description. This is the category of “white-collar” workers in the third position in the ranking of jobs predicted to be in decline between 2023 and 2027, according to the Future of Jobs Report issued by the World Economic Forum in 2023. Routine, rule-based and repetitive tasks are perfect for an automation process (e.g., RPA) that has the role of saving a significant number of FTEs (Full Time Equivalent) at the company level. The staff displaced in this way needs professional reorientation, reintegration into the organizational chart of the organization having it maintained in the payroll.

Personnel with a higher qualification may face the *risk of deprofessionalization*; according to Al-Htaybat and von Alberti-Alhtaybat (2017), the predictive possibilities of data analytics are useful for internal decision making, but the accountants need additional skills to use data analytics, to analyze and interpret newfangled types of information. All the requalification has the gift of familiarizing the accounting professional with the new tools of digitalization, but they also have the potential to divert the focus of the human factor on some key aspects such as, for example, professional reasoning regarding situations/exceptions, or the application of regulations legislative or procedural.

The transformation of accountants into data analysts in the context of excessive technology can generate an accumulation of financial reports obtained automatically, but with the *risk of distortion of reality or error*. Thus, there is a transition to a new category of risks, namely, those *perceived at the level of the organization*, of which the first mentioned, of obtaining an information system in which the lack of involvement of specifically human critical thinking can generate errors in data analysis or incomplete reports. Scanning data from paper format can prove to be of low efficiency (for example, reading materials from matrix printers) and the information thus taken into the system is incomplete (Januszkeski *et al.*, 2021).

At organization level, *cybersecurity risks and privacy issues* are expected to become increasingly important, as information spreads faster and broader thanks to new digital technologies. It is about awareness of aspects related to intellectual property rights, the risk of theft or loss of financial information, sabotage, or disclosure of confidential and sensitive data at the company level (Timea Fulop *et al.*, 2022). Decision makers should be familiar with the potential risks of becoming overly reliant on data-driven numbers and visual representations.

The *risks of underestimating the costs of digitalization* are often neglected, especially when discussing the benefits of digitization in terms of budget savings (e.g., savings in manual labor hours) or increased productivity and operational efficiency. There is little or no discussion of the less visible or hidden costs of monitoring, professional retraining, information security, etc. specific to the post-implementation period of digitization solutions. At the same time, finding new assignments for the human resource displaced by digitization can become a real

challenge that, if not managed correctly, can become a cost. Basically, the economy of labor hours is only a gain on paper in the conditions that the company has the same number of employees who are not capitalized by other tasks or attributions (Eulerich *et al.*, 2022).

In a different approach, Deloitte's report on the impact of automation through RPA (Robotic Process Automation) on organizations draws attention to the inherent risks which it classifies as follows (Szalony *et al.*, 2018):

- ✓ *operational* – replacement of several operators by a single software robot, lack of control mechanisms in case of changes.
- ✓ *financial* – non-compliant implementation of technologies, incorrectly or incompletely designed algorithms.
- ✓ *regulatory* – implementation of solutions that do not comply with legislation or internal rules, lack of clear regulations regarding automation.
- ✓ *organizational risks* – producing a negative impact on the human resource displaced from specific tasks, incorrect or incomplete presentation of digitalization solutions.
- ✓ *technological risks* – affecting current IT platforms, introducing powerful algorithms with a negative impact on critical IT infrastructure.

The report states that these risks ultimately lead to financial losses and suggests control procedures at different organizational levels in all phases of the implementation of automation solutions. The solutions thus suggested are intended for organizational policies regarding accounting processes and contain a series of tools and measures depending on the degree of maturity and involvement of automation.

4.4. Digitalization risks management

The identified risks have the potential to transform a digitalization process into a direct threat not only to the accounting profession itself but also to the overall operational functionality of an organization. Awareness of these risks is an important step towards finding and applying the most suitable approaches both from the individual directly affected by digitalization and from the company that must keep up with the current technological momentum. The literature as well as specialized practice identify a series of solutions of a technical or procedural nature, according to Table 3.

Table 3. Risk management in accounting digitalization

Risks	Solutions	Documentaion source
Job loss Lack of skills	Development of a new set of technical skills (user of digital tools, developer, programmer, etc.) Development of analytical, creative thinking skills, etc.	World Economic Forum Report (2023)

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Risks	Solutions	Documentaion source
Employees deprofessionalization	Implementation of introductory programs/courses in digital technologies Organizational culture policies aimed at inducing the idea of complementary working tools regarding digital solutions, and encouraging creative thinking and professional reasoning regarding financial-accounting reports Involvement of all staff from the financial-accounting department in implementation, orientation towards motivating activities - monitoring, error intervention, supervision of the final form of financial report, etc.	Kokina and Blanchette (2019)
Errors in financial accounting processing and reporting	Correct identification of operational flows within the organization Establishing a central procedural framework across the organization with clear work procedures and rules for managing and monitoring RPA Use of appropriate technologies - e.g., the use of powerful scanners/reading programs - e.g., OCR (Optical Character Recognition) The use of standardized digital solutions in the issuance and exchange of documents between the organization and third parties	Moreira <i>et al.</i> (2023), Kokina and Blanchette (2019), Januszewski <i>et al.</i> (2021), Eulerich <i>et al.</i> (2022), Szalony <i>et al.</i> (2018)
Security risks	Strict inventory of implemented technologies, clear access procedures for employees of financial and accounting departments Periodic checks and controls, external auditing	Eulerich <i>et al.</i> (2022)
Underestimated digitalization costs	Identifying all accounting operational flows, maintaining a procedural stability that avoids further changes in the implemented systems. Use of proof of concept (POF) Involvement of accounting professionals from the design phase of digitalization solutions	UIPath (2023) - www.uipath.com

Source: own projection based on documentaion sources

5. CONCLUSIONS

The World Economic Forum report for the next 5 years (2023 – 2027) presents a dynamic on the jobs threatened by the digitization process and, more than that, brings to the fore a series of forecasts regarding the skills needed for current jobs to find a place in the near time horizon. The accounting profession finds itself in a position that is not comfortable, especially regarding activities like collecting data, recording transactions, issuing specific preliminary reports. Facing these findings to other studies regarding the trend of involving various

intelligent accounting processing or analysis tools shows that the financial-accounting field is an essential "target" of digitalization. In such a context, the article outlined a profile of the accounting employee who witnesses the insertion of new technologies in the work tools that is leading to a professional dilemma.

Computerization of accounting processes is not new, digitalization being an ongoing process; the current novelty comes from the automation capabilities that displace the human resource from the scope of routine tasks and that, if also supported by artificial intelligence, can generate complex and real-time financial accounting analyzes and reports. The present study, after a brief analysis of the stage of digital transformation in the field, shows that it comes as a response to the needs of efficiency in the sphere of information processing, acceleration of work speed, adaptation of accounting to contextual challenges. The manual preparation of the information desired by management is a long-term operation, exposed to errors and the need for subsequent rechecking, which determines the need for profitability, increased productivity of employees who are thus seen as norms or total working hours with a direct impact on the budget. Including the preparation of financial reports is a task that can be automated especially in the conditions where the retrieval of data from internal applications or other reports in digital format is carried out based on precise rules, from digitalized internal sources, in a structured way. Being a sector where the precision and speed of calculation are essential for the decision-making process, the tasks in the back-office area lend themselves to automation precisely because of the operational volume and the specific repetitive and routine character.

The answer to question Q3 is shaped, first, by the impact that digitalization has on the human resource in accounting departments, in particular, on employees with tasks that require medium training. It has been demonstrated that risks related to the need for professional reorientation or even deprofessionalization can have negative effects not only at the individual level but also at the organizational level. Excessive digitalization can shape an information system lacking typical human reasoning, thus generating errors in the recording of transactions, the generation of reports, the analysis and monitoring of operational flows. If data digitalization is apparently sufficient for their takeover in the automation process, the risks generated by the incomplete reading of some .pdfs or the intrinsic modification of the targeted processes can lead to the cancellation of the desired effects and, more than that, to the reintroduction of manual work (Kokina and Blanchette, 2019). The management of companies that have gone through the RPA experience recognize several difficulties in implementing such a project due to several considerations (Szalony, 2018):

- Insufficient preparation of the data involved.
- Incomplete knowledge of information flows.
- Failure to make necessary corrections in the standardization of the processes targeted by automation.

- Implementation of poorly designed algorithms, robots with errors.
- Failure to prepare or neglect the human factor displaced from specific tasks.
- Lack of clear rules or standards from regulatory bodies regarding automation.

In response to question Q4, proper risk management consists, first, in identifying and standardizing the processes targeted by digitalization along with subsequent monitoring of processes and how digital technologies work. These measures are intended to ensure the functionality of such an accounting information system, to bring added value in the effort to structure the financial reports necessary for decision-making within an organization. Implementing clear procedures and strict policies on how these virtual "workers" are managed in terms of access to data, algorithm updates, sensitive databases, contributes to the desired scalability of the project and a much-needed information security.

Given that the insertion of artificial intelligence components is already a reality in the sphere of financial-accounting information processing, the author believes that one more direction of research is needed to anticipate the impact of these tools on financial reports. The human factor still has the final say in the completion of periodic situations, but the outlook heralds an inevitable paradigm shift. As the World Economic Forum report reveals, the foreshadowed transformations are for a short time horizon, the accounting professional having to abandon traditional patterns, be self-taught, flexible and willing to change at an increasingly alert pace.

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THE SILVER ECONOMY AND ITS IMPORTANCE TO SOCIETY

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Abstract

Based on the need for a prosperous economy and society, the medical system is one of the important factors in maintaining the health of the population, which is essential to the economy. The modern organization of society, aimed at increasing productivity, intensity, and quality of work, leads to early wear and aging of the human body, an increase in the frequency of illnesses, and thus, most of the time, early retirement from the labour field. In this sense, the ways of financing the health sector are important for the expansion of the network of medical services, the creation of medical, social, and professional recovery systems, the continuous improvement of the health sector, and the activation of people for a longer period of time in their work fields. By developing this article, the authors propose to trace the formation of the silver economy concept, the evolution of retirement, active aging that has a significant contribution to the economy, as well as their repercussions on the economy. It is obvious that active aging took shape from the need for a balance in the economy regarding retirement cases. The evolution of relations related to the labour market against the background of economic and social development is necessary to lead to an increase in interest in ensuring an optimal standard of working and living conditions for the population in order to reduce the repercussions of a low standard of living on the economy, by reducing the force of work.

Keywords: *economy; silver economy; active aging; health.*

JEL Classification: A12, B26, H51, I15.

1. INTRODUCTION

The need for individual and collective security has always existed. Since ancient times people have begun to protect themselves and their dependents from events such as famine, pandemics, and other dangers. One of the main elements contributing to the creation of optimal living conditions, by providing people with the bare necessities, is retirement, through its various forms, which complements the social infrastructure.

One of the European Union's concerns is the population's aging and its financial sustainability. In this regard, Member States and European institutions are constantly working towards a comprehensive approach to this problem and for the continuous modification of the retirement age and pension systems so that they respond positively to the requirements of a flexible and dynamic economic and social system. The ongoing attempt to keep people at work as long as possible has led to the development of active aging or the silver economy, with beneficial effects on the economy and society.

Romanian society, after 1989, entered a process of transition from a multilaterally developed socialist society to a capitalist society and presented itself as a democratic society, oriented towards the market economy. The transition from the socialist to the capitalist political, economic, social, and cultural model can be achieved through a comprehensive reform of the whole society in all areas. The end of the transition will mark the achievement of a state of normality in Romanian society, recognized both in the national and international context. Transition, i.e. the modernization process, entails certain costs, which have a significant impact in economic, political, social, cultural, and other terms, and the costs of change have different effects on members of society.

2. LITERATURE REVIEW

Gordon (2016) identified demographic change as a factor slowing economic growth in the developed world, as an older population will reduce labor force participation and productivity. An aging population results in fewer people of working age, according to Anderson and Hussey (2000) and Bloom *et al.* (2011). When a country faces an increase in the elderly population, public costs for social spending, pension system, and health care system will also increase, according to Lisenkova, Mérette and Wright (2012), and Brooks (2003).

Acemoglu and Restrepo (2017) examined the relationship between population aging and aggregate economic growth and showed that there is no negative relationship between older populations and economic growth (in terms of GDP). The explanation they offer is technology - as populations age, corporations are more likely to adopt technology to help increase productivity.

Research by Prettner (2013) on the effect of demographic change on long-term economic growth prospects also indicates, among other things, that population aging is beneficial for long-term economic growth.

It must be recognised that the issue of population ageing is transdisciplinary in nature, requiring researchers in various fields to look for empirical evidence showing the effects that ageing has on the economy and society. The effects of ageing on the economy through its effects on the labour market and/or society have also been studied by Reuben, Silliman and Traines (1988), Cohen-Mansfield and Biddison (2007), Moody and Sasser (2012), Sabbatti (2013), and Barković and Nedić (2015).

3. THE EVOLUTION OF THE SILVER ECONOMY

The silver economy is described by Klimczuk (2015) as "all types of goods and services for older people and an aging population, including the extension of working life, volunteering, and active citizenship of older people" (Klimczuk, 2015, p. 77) or, in a narrower sense, adequate conditions for the provision of goods and services, i.e. the increasing purchasing power of older consumers (European Commission, 2007, p. 96).

Although the silver economy is of significant importance to society, we encounter various barriers to its development at national and regional levels, issues also noted by Klimczuk (2015). (1) low interest of market entities in this concept in some regions, (2) perception of the silver economy as a commodity for wealthy older people, (3) unfavorable consumption patterns for older people and low attractiveness of some regions for older migrants and travelers; (4) low interest of business entities in developing and implementing the silver economy in some peripheral regions, such as rural and border regions; (5) deficiencies in social infrastructure.

As early as the 1870s, the first forms of active retirement, associated with employer-paid pensions, emerged in the United States in the railroad industry out of industry concern about the continued employment of retired workers. Thus, railroads initially redeployed older workers to night watchman positions or other jobs that minimized their health or safety risks to the public. Often, such reassignments were accompanied by a pay cut, representing reduced responsibilities (Graebner, 1980, p. 14). In 1874, the first private pension plan was established in Canada, under which pensioners were still active; the plan aimed to maintain an efficient workforce, encourage older people to work, and only withdraw them from the workforce if they were no longer able to perform light work. In 1875, American Express was the first private retirement plan in the United States to provide financial aid to workers who were injured or could no longer be employed. In 1880 another active retirement plan was established by the state as part of a broad initiative to provide for the welfare of workers by keeping those with the labor force in the workforce (Sass, 1997, pp. 18 – 30).

By the end of the 19th century, active retirement plans were also beginning to appear in education, at Cornell University, Harvard, the University of California, and Yale University. In 1905, according to Greenough (1990), Andrew Carnegie, a Scottish-born American businessman, and philanthropist, owner of the Carnegie Steel Company trust, which brought him a huge fortune, was concerned about the low pay of university professors and the old age of which they were working in the labor market and set up a free pension scheme for them, which he sponsored with \$10 million. In 1906, 52 universities were accepted under the umbrella of that system. Ultimately, the system proved to be underfunded and was closed, but it served as a precursor to the future comprehensive active pension system for teachers, the Teachers Insurance and Annuity Association of America (TIAA), created in 1918 (Greenough, 1990, pp. 5 –16).

The silver economy started from active aging or active retirement, which is a necessity for economic and social progress. To this end, the World Health Organisation launched the concept of "active aging" in 2002 (World Health Organization, 2015, p. 4) with the stated aim of providing an incentive for people who retired on grounds of age to remain in employment. This concept aims to optimise opportunities for health and safety to improve the global economic situation. It proposes the promotion of a healthy lifestyle through programmes to prevent the main causes of ill health, which would enable people of retirement age to continue working. Thus, the term 'active ageing' refers to the continued participation of older people in economic, social and cultural life, their ability to be physically active and to continue working. Once retired, older people can actively contribute to the economy, and the aim of active ageing is to increase the healthy life expectancy and quality of life of retired people, including those affected by disability or incapacity. In this regard, the objectives of active ageing strategies are to reduce premature death; limit disability and chronic disease in older people; increase the quality of life of older people; reduce the cost of health care; continue to develop accessibly, enabling, quality health and social services; provide continuing education and training for health and social care staff (World Health Organization, 2015, p. 181).

Jacobs, Kohli and Rein (1991) consider, in the case of Germany, it appropriate that when people no longer have the skills to perform the work in which they are employed, they should perform less demanding work, even after retirement age. Guillemard and Rein (1993) argue for retirement with fewer hours and less difficulty, a point also supported by Hernús, Sollie and Strùm (2000) in their article "Early Retirement and Economic Incentives". Daly and Bound (1996) pointed out that these older workers, whose productivity may be affected by their health status, may not possess a skill set that would allow them to transfer to a job more suited to their health status, or perceive the rewards of early retirement as more advantageous than retraining or finding a new job. Rogowski and Karoly (2000) show that the possibility of returning to work after retirement has a large

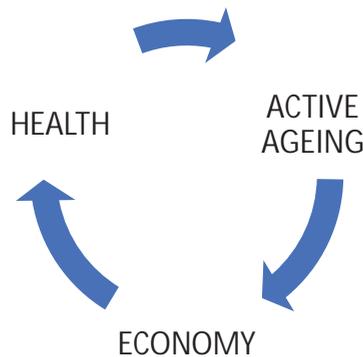
effect on early retirement. Among older male workers, the possibility of remaining in employment increases the chances of early retirement by 68%, compared to people who would lose their job on the basis of retirement, whose intentions for early retirement are 44%. The guarantee of a secure income, as well as the possibility of remaining in employment and thus having an income in addition to their pension, determines the decision to retire early.

One of the most common causes of early retirement is health-related, with most research positively linking the two. Early British researchers, such as Parker (1982) in the article "Older Workers and Retirement" or Altmann (1982) in the article "The incomes of the early retired", proved that poor health played a major role in the retirement decision of older workers. Anderson and Burkhauser (1985) pointed out that early retirement through self-reported health status may influence the labor market, as some workers may tend to overestimate the role of health in their retirement decision.

4. THE IMPORTANCE OF ACTIVE AGEING FOR THE ECONOMY

One of the biggest challenges facing virtually all countries is the economic and fiscal disruption to public pension systems caused by the changing demographics of their populations. There are two major developments responsible for this phenomenon: (1) firstly, a steady improvement in health care and medical advances, leading to ever-increasing life expectancy; (2) secondly, low fertility and a substantial fall in the birth rate, which took shape in the late 1960s. Both of these effects are leading to a significant change in the age structure of the population, which has put increasing pressure on existing public pension systems in Europe. While the consequences of this are observable today, they will become much more dramatic in the near future. Therefore, a simple adjustment of contribution rates or pension payments could only shift the burden between contributors and beneficiaries, but could not solve the demographic problem (Hillebrand, 2008, p. 2). Thus, the proportion of people aged 65 and over will increase dramatically in relation to the working population aged 15-64. In the European Union, the age-specific retirement rate is projected to rise from a current level of 24% to 49% in 2045, which is much higher than in the United States (World Health Organization, 2002). The share of transfers directed from the working-age population to the elderly must double in the coming decades if future pensioners are to maintain their standard of living. However, for the reasons described above, it is unlikely that this increase in intergenerational transfers can be achieved by doubling contribution rates. Other measures need to be considered to address the consequences of demographic aging for national pension systems (Schludi, 2005, p. 15). One solution would be for pensioners to be employed, but for this to be possible, they need to be in good health to enable them to work into old age.

Early retirement for health reasons has consequences at the individual level, as income will be reduced, but also at the national level through pension payments. The relationship between ill health, early retirement, and the economy has been the subject of numerous studies, so Boskin (1977) found that, in the case of some illnesses, the guarantee of even lower incomes compared to the level of wages, in addition to social security, is one of the determinants of early retirement. Quinn (1977) argued that when the level of early retirement is approximately equal to the wage level, the probability of labor force participation is 26 percentage points lower. Yelin and Callahan (1995) demonstrated that in 1992, muscle disease in the US resulted in government costs of \$149.4 billion, of which 48% were direct health care costs and the remainder were indirect costs resulting from lost worker taxes and pension payments; this amount represents a 2.5% decrease in GDP, and the economic impact of this disease, increases with time. Perryman and Gleghorn (2010) conducted a study from 2000 to 2005 that included a total of approximately 14,100 employees in Texas, showing that 4,700 of them, with an average age of 43.7 years, retired early due to obesity. This process meant losses of \$2.20 billion in GDP. Laires (2017) reports the period 2005 - 2006, in which 37.2% of the Portuguese population aged 50 - 64 years, reported suffering from rheumatic diseases and 52.6% of them retired early. Indirect annual losses to the state due to an early exit from the labor force attributable to this condition were €650 million and early retirement cost €367 million.



Source: the authors

Figure 1. The relationship between health, economy, and active aging

The relationship between health, active aging, and the economy (Figure 1) is very important for society, as it is one of interdependence; thus, healthy people can work longer in the labor force and support the economy by paying taxes, by having less access to public health services and, last but not least, active people are also psychologically healthier, an important aspect for society.

5. THE ROLE OF GOVERNMENT IN ENSURING THE WELFARE OF THE POPULATION

Health status is of major importance to the economy through the labor force, avoiding early retirement for health reasons and active aging. A country's economic losses are greater when the population is not healthy, through the payment of pensions, free and compensated medication, and the failure to collect taxes from workers. Investment in socio-economic determinants on the one hand, and in the health system on the other, would, by raising the standard of living and making it possible to investigate health conditions promptly, lead to people staying in work and reducing state expenditure.

In his work, Titmuss, cited by Reisman in *Richard Titmuss Welfare and Society* (2001), explained the role of the state in providing welfare to the population in four ways: cash benefits, health care, education and food, housing, and other welfare services. Cash benefits include a contributory and a non-contributory component. Contributory benefits are provided in case of social vulnerability, such as unemployment, old age, or incapacity for work, and include pension insurance, unemployment insurance, health care services, and health insurance. Non-contributory benefits can be: universal when they are granted without a prior contribution (child benefit), or income-tested (income-based social assistance for poor families) (Reisman, 2001, pp. 113 – 115).

Between 1950 and 1975, after a period in which the Western welfare state consolidated itself as a socio-political and economic system, there followed the period 1975-1980, in which the welfare state faced deep internal imbalances, caused in particular by a lack of labour. The third period, after 1980, was characterised by the search for pragmatic solutions to the crisis. Thus, the role of the state in providing welfare was limited. One of the principles of the 1996 US reform was to make work compulsory for people in the labour force, with the application of sanctions and regulation of the period for unemployment benefits. On the basis of the individual's potential for work, personalised plans were drawn up, the implementation of which was monitored and non-compliance sanctioned. The adoption of such measures helped to improve employment and the creation of favourable conditions for ensuring full employment was seen as the key to providing welfare for the population (Sinfield, 1989, p. 65).

Among the authors who have studied the role of the state in ensuring the welfare of the population, we mention Pierson (1996) who has argued, among other social programs, for the importance of providing pensions. His proposals for outlining a typology in this regard were complemented by Korpi and Palme (1988) who distinguished between state welfare, the welfare state, and welfare systems in their analysis of the universalization of social benefits. One of the best-known theories of the role of the state in ensuring the welfare of the population belongs to Esping (2003), a theory developed in the book *Social Foundations of Postindustrial Economies*, through three models, namely: the conservative or

corporate welfare state model, the liberal welfare state model, and the social democratic welfare state model (Esping, 2003, p. 32). The indicators he uses in constructing the typology are "the number of distinct pension schemes, the insurance coverage of the population, the difference between average and maximum benefit levels, the magnitude of expenditure in terms of the relative measure of government employee pensions, earnings-related benefits, private sector pensions, and the private health care sector" (Esping, 2003, p. 83). The analysis and selection of indicators served the purpose of highlighting the role of the state in providing welfare to the population.

6. CONCLUSIONS

Total health care expenditure should be roughly equal to population contributions, given that not everyone who pays into the system needs health care. However, costs for this sector have risen in recent years at rates that outstrip income growth, and this gap is a prominent problem for many nations. The causes stem partly from the unhealthy lifestyle of some people and partly from a lack of investment in prevention. The key factor here is low national incomes, which do not allow for improvements in individual lifestyles and also do not allow for investment in a quality health system capable of meeting all demands. The main causes of rising healthcare costs are medical technology, human resources in the system, treatment, price inflation, and an aging population. A continued increase in health expenditure may be unsustainable, especially in light of current and projected budget deficits. In this regard, governments have been looking for appropriate solutions to finance the rising costs of health care, given increasingly constrained collective resources. Maintaining compulsory universal access to basic services, continuous improvements in technical efficiency and medical staffing, low financial resources of the population leading to less healthy lifestyles, and the dynamic nature of this type of service are factors contributing to the continuous increase in costs in this sector.

The precarious situation of the pension systems calls for short-term and long-term solutions to balance them. Studies show a continuing increase in life expectancy and very low employment among older people. The contributory principle and social solidarity are at the lower limit of the sustainability of social security systems, and current contributors' distrust of future beneficiaries (pensioners) is growing.

The costs of early retirement for health reasons are very high and continue to rise. The phenomenon is impossible to stop, but with the support of policymakers, it could be reduced. Actions such as improving the social determinants of health, which come from the standard of living, and investment in the health system at the level of each individual country, lead to improved health status and thus to a reduction in the number of early retirements and active aging, i.e. the silver economy. These aspects significantly improve the economy.

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SELF-RATED HEALTH AND HEALTH INDEX – A REVIEW

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Abstract

Self-rated health as a statistical variable commonly occurs in medical field research. Hence observing the health measures that have been featured in studies over the past few years is essential for future research. Having an overview of Self-Rated Health (SRH) is a great way to provide further solution for new approaches. This Systematic Review contributes to the literature related to health measures by summarizing the latest relevant papers published between 2018 and 19th April 2023 regarding SRH and other health approaches. Monitoring the health measures used in the relevant articles for past years and observing their frequency helps to find out if there is a need to create a better health measure. 598 open access English papers were found on Scopus by searching the terms „health index” and „self-rated health” from 2018 to 19th April 2023. The steps for this systematic review include the selection of literature, the inclusion/exclusion criteria, the screening of the SRH and other health measures of approaches and the data extraction. The review question is regarding the evaluation of SRH in comparison with other approaches: “Does SRH occur more in this sample than other health approaches?”. The aim of this review is to provide researchers and health policy makers an overview of the SRH used in latest research on Scopus by searching for both subjective and objective measure terms. The main finding was that for the selected articles the SRH is more common than the other health approaches. 77.4% of the examined abstracts include SRH and 22.6% include other health measures or health approaches or both - SRH and a different health measure or approach. A future research directive is to test a health index and compare it with the existing ones.

Keywords: *self-rated health; health index; systematic review; health policy making.*

JEL Classification: I1.

1. INTRODUCTION

Public health policy making requires being supported by decision-making tools, data analyses. (Prasinos *et al.*, 2022). Hence observing the health measures that have been featured in studies over the past few years is a major focus for research. In this paper are gathered the health measures used in the past years in research. However, having an overview of the variables used for measuring health is a great way to provide further solution for new approaches of health indexes.

Looking back in 2002, as a result of the Marrakech Conference, has been published on World Health Organization Library a set of studies about measuring health. Has been stated that the true level of health may be expressed by tested health, observed health and perceived health on an individual level. Specifically, health can be measured by laboratory health tests or functional tests, by clinical assessments of professionals or other assessments. The WHO has pointed out that there is no ideal measure of health that covers all aspects of health or assesses everything that people perceive (Iburg *et al.*, 2001). Health is difficult to measure. It is well known that health has many dimensions, and reflects the interaction of a set of factors including the mental, physical and social well-being, genotype and phenotype influences (Thomas and Frankenberg, 2002) The population health may be described also through health indexes. One of those is SF-6D Survey having as the most important dimensions the mental health, the physical functioning and the pain. Also, modelling data on stated preferences is also becoming increasingly essential to support health policy makers (Brazier, Rice and Roberts, 2002).

In terms of the health indexes, the SF-36 survey is one of those surveys that measure health on several dimensions. The items are related to perception about health (Brazier, Roberts, and Deveril, 2002). The SF36 survey uses eight dimensions and three categories: well-being, functional health and general health. The scores are between 0 and 100, and at the end they are summed up (Garratt *et al.*, 1993). Moreover, some authors have addressed about the SF12 survey which was developed from the SH36 survey. SF12 took 12 items from SF36. Two summary scores were generated, mental and physical health (Brazier and Roberts, 2004). SF36 was also mentioned in an article about measuring health in arthritis. It was said that the two categories created, physical and mental health, are valid and reliable in Rheumatoid Arthritis patients (Ruta *et al.*, 1998).

With reference to self-rated health, in an article about health-status measurements, the authors used the questions related to subjective measure of health, rating health on a scale of 1 to 5, from very bad to excellent. A question has also been added asking respondents about their overall health compared to a week ago (Cieza *et al.*, 2002). In a study on health measurement as a predictor for the elderly, the hypothesis was that perceived health status is a predictor of mortality among the elderly independent to objective health status. Data from the Manitoba Longitudinal Study on Aging was used. A single item was used for subjective health status and an index was created for objective health status based on respondent-reported conditions and health service use. The date of death was recorded as 1971-1977 (Mossey and Shapiro, 1982). In the article “ A New Measure of Health Status for Clinical Trials in Inflammatory Bowel Disease” the authors have designed a subjective health measure for inflammatory disease patients using quality of life (Guyatt *et al.*, 1989).

In regards with health policies, it is essential for a health index to be suitable for measuring and monitoring changes in health at community or national level. In 2003, it was stated that a multi-dimensional population health index would be a very useful tool to achieve health policy strategies. In addition, more research on this area is needed to identify which health indicators could be combined and the best method to achieve this (Kaltenthaler, Beverley and Maheswaran, 2004).

This Systematic Review contributes to the literature related to health measures by summarizing the latest relevant documents published between 2018 and 19th April 2023 regarding health measures used. Monitoring the health measures used in the relevant articles for past years and observing their frequency helps to find out if there is a need to create a better health measure. The search is only limited to English language and limited to open access. The articles are selected from Scopus database. The aim of this review is to provide researchers and health policy makers an overview of the SRH and other health measures and approaches. The focus is on the frequency of Self-rated health for the selected sample. After the document's selection, 598 documents are chosen from Scopus database. The SRH and other health approaches from the abstracts are extracted from each.

The frequency of SRH and "Other" from the selected sample are observed. The review question is regarding the evaluation of SRH: "Does Self-rated health occurs more in this sample than other health approaches?"

In the next section, a brief history of some systematic reviews that have already been conducted is outlined. Then the methodology of the Systematic review is illustrated, followed by the implementation part, specifically the table and graphs with useful information on SRH. Then are the discussion and conclusion part, including some pointers for future research in measuring health.

2. EARLIER REVIEWS

In 2003 a systematic review was conducted for the health indexes known at that time. Studies from 1966 were also the evidence base for the systematic review. The authors performed a general search of the literature using keywords such as health status indicators, health indices, and after some time (March 2001) added more specific keywords such as health status index, gross national health product, cumulative disease index, health status measure, general index of health, etc. to the search. Of the 972 references identified from the references only 73 were considered relevant, selecting only those that were population-wide, not individual-level. They extracted components such as index, country, index description and index usefulness, including health indicators and index validation. (Kaltenthaler, Beverley and Maheswaran, 2004)

A systematic review for subjective well-being measure for 2007-2012 was performed. Subjective well-being was classified into subjective and objective. (Lindert *et al.*, 2015). A systematic review for HRQL (health-related quality of

life) in injury using health measure such as SF-36 and EQ-5D was conducted for 1995-2009 period. The focus was for HQRL. In the article's selection the search was also about health status measure, but the focus was on injuries and HRQL. They selected the relevant articles who met the set criteria and screened the title, abstract and the full text and tabulated the data (Polinder *et al.*, 2010). In 2011, a review for general health measures and HRQL has been conducted. The criteria for the articles was about rheumatology literature and for the adults only. SF-36, SF-12, Euro-Qol 5 domain are some of the measures used for assessing the general health and HRQL (Busija *et al.*, 2011). In 2015 has been conducted a systematic review for health measure and well being in regards with interventions evaluations. The terms used for selection of the studies are not only related to health measure (i.e. community, wellbeing or quality of life) (Dronavalli and Thompson, 2015).

3. METHODS

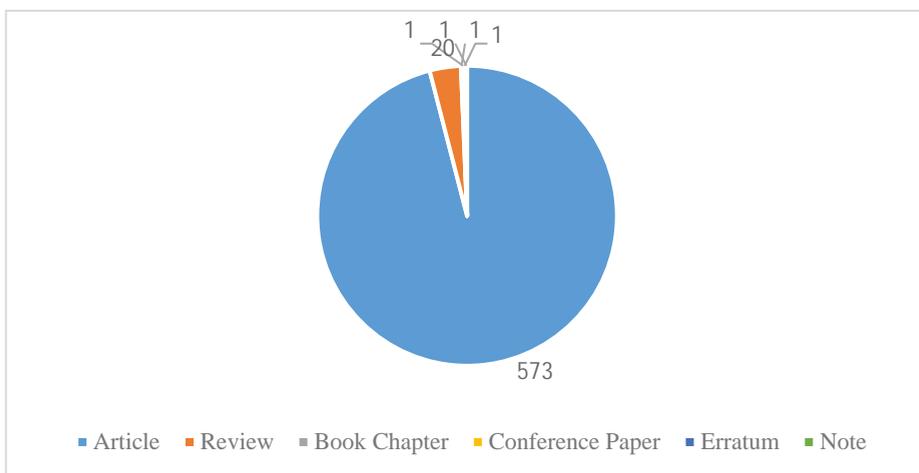
The steps are: selection of the documents, presenting the criteria for inclusion/exclusion, screening the Self-rated Health and other health measures and approaches and data extraction.

3.1. Document selection

The first step is to identify the documents which are related to health measure, including Self-rated health and health indexes, starting 2018 and ending 19th of April 2023. The search strategy includes terms as health index and Self-rated health. The database used for searching is Scopus. The language is limited to English only and the access of the articles to "open access". The output search from Scopus is displayed below:

```
( TITLE-ABS-KEY ( health AND index ) AND TITLE-ABS-KEY ( self-rated
AND health ) ) AND ( LIMIT-TO ( OA , "all" ) ) AND ( LIMIT-
TO ( PUBYEAR , 2023 ) OR LIMIT-TO ( PUBYEAR , 2022 ) OR LIMIT-
TO ( PUBYEAR , 2021 ) OR LIMIT-TO ( PUBYEAR , 2020 ) OR LIMIT-
TO ( PUBYEAR , 2019 ) OR LIMIT-TO ( PUBYEAR , 2018 ) ) AND ( LIMIT-
TO ( LANGUAGE , "English" ) )
(extracted on 19 April 2023)
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There are 598 documents to be screened; most of them are Articles, followed by the Reviews and Book Chapter, Conference Paper, Erratum and Note, as shown in Figure 1.

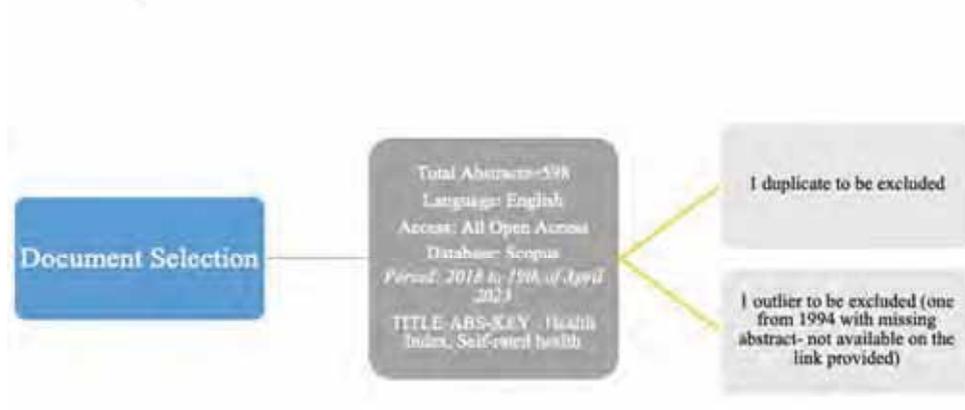


Source: own processing

Figure 1. Type of document for the selected sample

One duplicate is excluded from the analysis, 1 outlier from 1994 as well.

At the first check, we have 598 documents, but two of them are excluded, as they are duplicate and outlier (Figure 2).

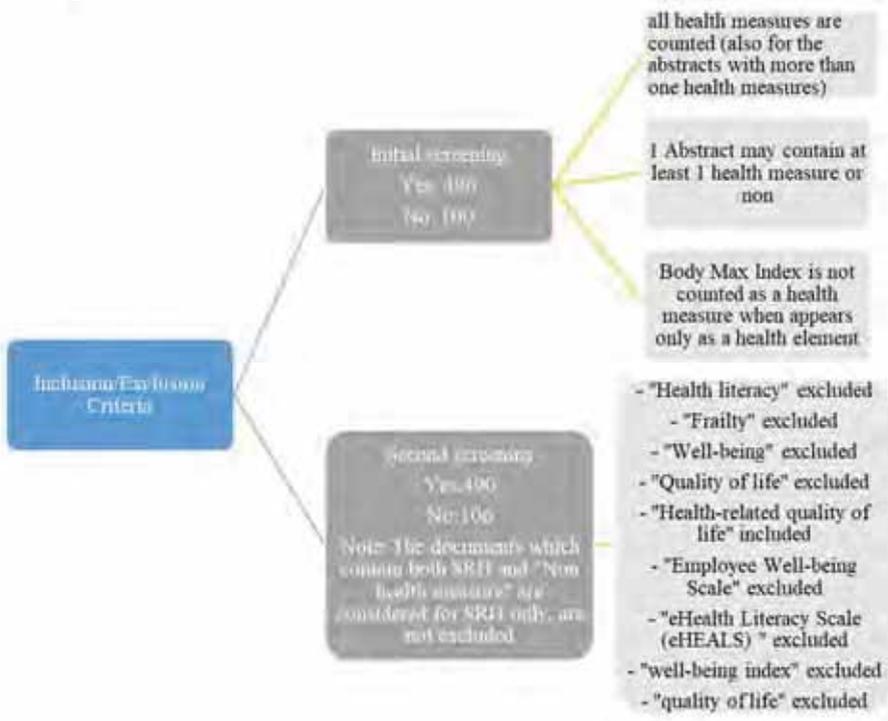


Source: own processing

Figure 2. Document selection

3.2. Criteria for inclusion/exclusion

The ground rules for inclusion and exclusion help us to keep focusing on the purpose of this paper. The initial screening counted all health measures and approaches from the abstracts. An abstract may contain one or more health measures or even none. The “Yes” ones are all considered. The information is provided in Figure 3.



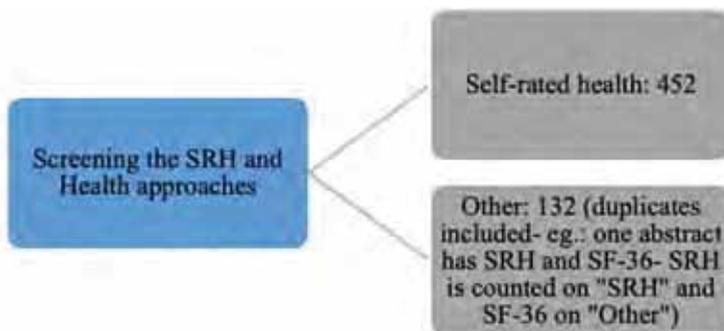
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Figure 3. Inclusion/Exclusion criteria

The second screening excluded 6 documents but included some others which contained also another health measure considered already.

3.3. Screening the health measures

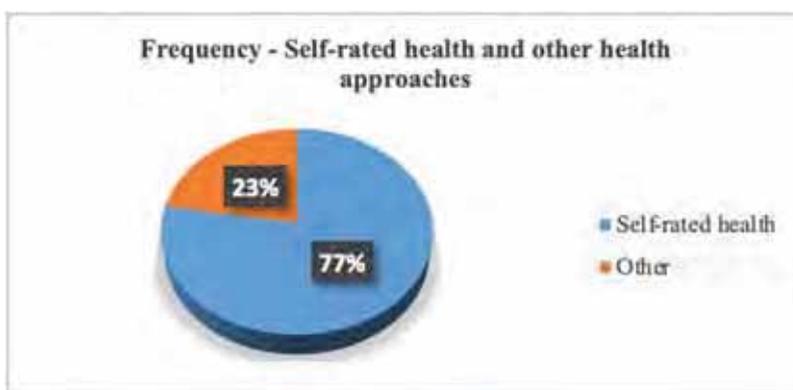
For this systematic review, the screening examines the abstracts. The frequency of the SRH and “Other” is tabulated in the data extraction (Figure 4).



Source: own processing

Figure 4. Screening the SRH and Health approaches

From all the „Yes” abstracts, only 452 have in their content the Self-rated health or other similar term for it. The „Other” found are 132, which include the duplicates with one or more accepted approaches for health measure.



Source: own processing

Figure 5. Frequency of SRH and Health approaches

In Figure 5, 77.4% of documents have SRH in their abstract content, and 22.60% have “Other” health measure or approach in their abstract.

3.4. Data extraction

The relevant information included in the data extraction is the health measure, the count and the frequency observed.

Table 1. Frequency of Self-rated health and Other

Health Approach	Count	Frequency
<i>Self-rated health</i>	452	77.40%
<i>Other (including health index, SF-36, Health-related quality of life, etc.)</i>	132	22.60%
Total	584	100%

Source: own processing

Self-rated health is the most common in the selected sample. The others have only 22.6% use in the past few years.

4. DISCUSSION

Most of the abstracts have Self-rated health in their Abstract content. 77.4% of the reviewed abstracts contain SRH and 22.6% contain other health measures or health approaches or both- SRH and another health measure or approach. Within “Other”, 14.38% of the abstracts are mainly about Short Form V.2, SF-36, SF-36, SF-12, SF-6D, health related quality of life, EQ-5D, EQ-5D-3L, EQ-5D-5L, CDC HRQOL-4. Thirty-three health measures or health approaches have less than 1% frequency of occurrence in the selected “Yes” sample.

On this analysis, the most cited two health measure approaches from the first most cited two documents from all the “yes” documents are presented in Table 2.

Table 2. The most cited 2 documents from the sample

Year	Health measure approach	Cited by
2019	EQ-5D, EQ VAS (Janssen <i>et al.</i> , 2019)	127
2021	Self-rated physical health (Corley <i>et al.</i> , 2021)	97

Source: own processing

2019 was the year with the most cited document from our sample, followed by 2021 having SRH as a health measure.

5. CONCLUSION

Self-rated health may be a challenge for statisticians and medical researchers. As a result, in this review, SRH occurs 74.4% from the selected sample of articles. So the most common health measure in the selected sample (abstracts) is Self-rated health. Other approaches for health are less frequently observed. The aim of this study was to provide researchers and health policy makers an overview of SRH and other health approaches used in the latest research. 77.4% of the examined abstracts include SRH and only 22.6% covers other health measures or health approaches or combined - SRH and another health measure or approach.

Does SRH measure health accurately? - this is a research direction that would help health policy makers in their decisions. Health policy making are usual supported by the data and statistics side and if it is found that another measure of health as a variable would be more suitable in studies, then it would automatically improve decisions. A future research directive is to test a health index and compare it with existing ones.

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CARBON PRICING IS A TOOL TO DECARBONIZE THE ECONOMY

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Abstract

This article identifies the modality of putting a price on carbon for helping shift the burden of damage from GHG emissions back to those who are responsible for it and can avoid it. Implementation of carbon pricing instruments can be an effective tool for achieving 2030 more ambitious targets of reducing GHG emissions by 2030 set up in the updated NDC2 Nationally Determined Contribution from 2020 (NDC2). The high vulnerability to both climate and external shocks (dependence on imports for energy) is the biggest economic challenge of the Republic of Moldova.

This article aims at providing the approach to the problem of the legislative framework in Moldova is under a transition period from a passive environmental approach to a new modern strategy by turning climate and environmental challenges into opportunities while taking fairness, solidarity and cost-effectiveness. There are no provisions on climate change mitigation and adaptation in primary legislation and no legal basis which creates concrete impediments in the law-making process and in the implementation of new administrative procedures harmonized with the EU standards, in strengthening clear institution obligations in data management and low data accessibility. The Republic of Moldova should set priorities for implementing legislative measures related to climate change, taking into consideration the on-going debate on the Energy Community Decarbonization Roadmap and based on the process of recent EU candidacy admission of the RM.

We underline the necessity of elaborating on the new Climate Change Law, which will consolidate of adopted legal framework to implement measures to reduce greenhouse gas emissions by sources and enhancement of removals by sinks at a level that would prevent dangerous anthropogenic interference with the climate system.

Keywords: *carbon price; climate change; greenhouse gas emission; decarbonization; climate action law.*

JEL Classification: K32, K 33, Q52, Q54.

1. INTRODUCTION

The high vulnerability to both climate and energy crisis shocks, is the biggest economic challenge of the Republic of Moldova. The shock of climate change on agriculture is of strategic concern – agriculture is a major source of income in the country, where more than half the population lives in rural areas and about one - third of the labor force is employed in agriculture.

In conformity with the third Biennial Update Report of the Republic of Moldova, over the last 132 years, the Republic of Moldova has experienced changes in average values of temperature and precipitation. The country had become warmer, with an average temperature increase of more than 1.2°C, while increase in precipitation was only 51.3 mm. (The third Biennial Update Report of RM)

The Government, in its national development policy set priorities for implementing measures related to climate change relevant to the Republic of Moldova, taking into consideration the on-going debate on the Energy Community Decarbonization Roadmap and based on the process of recent EU candidacy admission of the RM.

Moldova is a contracting party of the Energy Community Treaty - EnC Treaty (Council Decision 2006/500/EC of 29 May 2006 on the conclusion by the European Community of the Energy Community Treaty) since 2010 and in June 2022 the Republic of Moldova was granted EU candidate status.

The approximation of Moldovan legislation with European Union Green Deal - EU EGD (The European Green Deal (COM(2019) 640 final, 11.12.2019) acquis is justified by a set of international obligations ratified by the Republic of Moldova.

The *UN United Nations Framework Convention on Climate Change* (The Parliament Decision no.444/1995) was adopted on June 1992 and entered into force on December 1992 (status in force: Moldova 1995), is aimed to achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.

The *Paris Agreement* (PA) (Law no. 78/2017) was adopted in 2015 with an objective to limit global warming below 2°C, ratified by the Republic of Moldova (status in force: Moldova 2017). In order to achieve this objective all its signatory Parties are to communicate national actions to reduce GHG emissions to the UNFCCC through their Nationally Determined Contributions (NDCs).

The Republic of Moldova, has committed in 2020 in updated NDC (NDC2) to achieve more ambitious reduction targets than those included in the NDC from 2015. The updated unconditional target provides for a reduction of GHG emissions by up to 70% by 2030 compared to the level of the reference year 1990, instead of 64-67% undertaken in the INDC. Regarding the conditional target, instead of the 78% undertaken in the NDC from 2015, the reduction commitment expressed above could be increased to 88% as compared to the 1990 level,

provided that external support is obtained, including in form of low-cost financial resources, technology transfer, and technical cooperation, etc.

In accordance with the Third Biennial Update Report of the Republic of Moldova, the energy sector, distinguished by the most important contribution to GHG emissions in the Republic of Moldova (67.5%, 2019), will significantly contribute to meeting the country's commitments to reduce GHG emissions. In 2019, the sector "Industrial Processes and Product Use" contributed about 7.2% of total GHG emissions, of which 76.7% accounted for CO₂, and 23.3% were F-gases.

The first important step towards the integration of planning, reporting, and monitoring obligations in the energy and climate field and toward the implementation of the PA, including the harmonious integration of MRV requirements under UNFCCC is the elaboration of the integrated national energy and climate plans (NECPs).

In the Republic of Moldova, there is no national energy and climate plan elaborated in conformity with Regulation 2018/1999 of 11 December 2018 on the Governance of the Energy Union and Climate Action. The indicator of the fulfillment of the "National Energy and Climate Plan (NECP)" is assessed at 20% in the Country Report of 01.11.2020 sent to the Energy Community.

In spirit to further efficiently implement the Energy Community Decarbonization Roadmap, the Ministerial Council invited its Energy and Climate Committee to establish a dedicated working group on the conceptualization of a carbon pricing system and to develop proposals for discussion at the 2023 Ministerial Council meeting.

Taking into account the European Union's carbon border adjustment mechanism (CBAM) initiated, in case of electricity market coupling, as foreseen in the CBAM Regulation EU 2023/956, a carbon pricing system may allow, to deduct of such a carbon price from the carbon border adjustment, as provisionally agreed by the EU Council and EU Parliament.

The present article aims to provide an overview of how the Energy Community Decarbonization Roadmap relevant *acquis* are expected to be implemented in the course of the transposition on climate, energy, and environment-related legislation, proposals taking into consideration the current capacity level of institutional and legislative.

Achieving more ambitious NDC2 targets will be possible through:

- i. Advanced alignment with EGD related *acquis* and in the context of Energy Community Treaty on climate, environmental and energy matters;
- ii. Approximation of Moldovan legislation with the EU standards based on the framework for achieving climate neutrality of the European Climate Law;

- iii. Establishment of concrete guidelines for the implementation of the Roadmap taking in consideration the ongoing debate on the EGD and the recent EU candidacy admission of the Republic of Moldova.

The methodology of the article is based on desk research, a gathering of official information by means of submission of information requests to respective state authorities, constant actualization of data, comparative legislative framework, legal assessment, comparative analysis and compliance review.

In preparing the article we followed main approaches:

- identifying of the gaps between the regulation and legislation framework on setting clear of EnC Decarbonization Roadmap targets and legislative framework of the Republic of Moldova;
- description of the most relevant provisions as well as an explanation how these relate to the existing rules of law in Moldova;
- write the conclusions and recommendations for efficient implementation the EnC Decarbonization Roadmap regulation and legislation framework taking in consideration the current capacity level of institutional and legislative.

2. LITERATURE REVIEW

The recommendations made in the Energy Community Study on Carbon Pricing Design for the Energy Community (Kantor, 2021) launched in 2020 by EnC Secretariat and which have been published in January 2021, were considered in the Decarbonization Roadmap for the Contracting Parties of the Energy Community.

The objectives of the Decarbonization Roadmap are: (i) to achieve to 2030 energy and climate targets and mid-century climate neutrality for the EnC; (ii) to establish a dialogue with the EU on the decarbonization priorities, the process, timeline and main elements of the roadmap; (iii) to make progress on agreeing to a carbon pricing system; and (iv) to establish shared political messages on subjects such as a coal phase-out and fossil-fuel subsidies (Policy Guidelines 01/2021/MC-EnC).

The EGD is the new growth strategy for an EU economy that aims to be sustainable, cleaner, safer and healthier by turning climate and environmental challenges into opportunities across all areas of policy in a way that is fair and inclusive.

The EU Green Deal proposed the EU strategy, aiming to transform the EU into a fair and prosperous society, improving the quality of life of current and future generations, based on a resource-efficient and competitive economy where there are no net GHG emissions in 2050 and under economic growth decoupled from resource use.

Then, the EGD analysis is focused on the detailed assessment of current policy areas and regulatory framework in the climate change field giving attention

to other sectoral documents of relevance (energy, environment) and their correlation with the EU climate acquis.

The Climate Action Initiatives under the EGD have been translated into action through:

-the *European Climate Law*, which includes a legal objective for the Union to reach the goals set out in the EGD. *The Regulation (EU) 2021/1119* ('*European Climate Law*') will help to meet the European Green Deal objectives while ensuring fairness, solidarity and cost-effectiveness;

- the *European Climate Pact* which encourages people, communities and organizations to connect and share knowledge, learn about climate change and develop solutions to fight climate change;

- 2030 *Climate Target Plan* Commission has proposed to increase the EU's ambition to cut greenhouse gas emissions by at least 55% by 2030 to set Europe on a responsible path to becoming net-zero greenhouse gas emissions by 2050. The package contains legislative proposals under the "*Fit for 55*" to revise the entire EU 2030 climate and energy framework, including the legislation on effort sharing, land use and forestry, renewable energy, energy efficiency, emission standards for new cars and vans, and the Energy Taxation Directive;

- *EU Strategy on Adaptation to Climate Change* aims to realize the 2050 vision of a climate-resilient Union by making adaptation smarter, more systemic, swifter, and by stepping up international action. This would mean adaptation awareness and planning spread to every single local authority, company and household; adaptation implementation well underway for those most affected; and global leadership in areas such as climate services, climate proofing, or nature-based solutions.

- *the Sustainable Europe Investment Plan* creates a framework will target climate, environmental and social investments, the latter as far as they are related to the sustainable transition and will mobilize through the EU budget and the associated instruments at least EUR 1 trillion of private and public sustainable investments over the upcoming decade.

In delivering the EGD, the focus will be on:

- Increasing the ambition of EU emissions trading
- Aviation and the EU ETS
- Social Climate Fund
- Increasing the ambition of the EU's Effort Sharing Regulation
- Land Use, Forestry and Agriculture
- CO₂ emission performance standards for cars and vans.

3. RELEVANT EU ACQUIS ON CARBON PRICING

i. Taxation of GHG emissions and Emissions Trading System. Cap and trade and a carbon tax are placing a price on carbon, correcting the market failure and taking advantage of market efficiencies, both approaches encourage the shift

to a lower-carbon economy. The taxation of energy products and electricity plays an important role in the area of climate and energy policy.

The proposal for recasting framework for the taxation of energy products and electricity is part of the EGD and of the “*Fit for 55*” legislative package focuses on environmental and climate issues to achieve the EU’s domestic greenhouse gas emissions reductions objectives and air pollution reduction. Reducing man-made GHG emissions can help to limit global warming. The EU Emissions Trading System is a basic pillar of the EU’s policy to combat climate change and its key tool for reducing greenhouse gas emissions cost-effectively. It is the world’s first major carbon market and remains the biggest one. Companies that are regulated by the EU ETS include stationary installations (such as power plants, industrial plants and other large energy users) and airlines. The EU ETS is regulated by Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC and Directive (EU) 2018/410 amending Directive 2003/87/EC to enhance cost-effective emission reductions and low-carbon investments, and Decision (EU) 2015/1814.

ii. Carbon Border Adjustment (CBAM) is intended to complement the Emissions Trading System and level the playing field between EU and non-EU businesses, ensuring that production of carbon-intensive goods does not shift from within the EU to third countries in order to take advantage of less stringent climate policies. It is due to take effect in a transitional form from 1 January 2023 and be fully operational from 1 January 2026. The CBAM seeks to replace the existing mechanisms (free allocation of EU ETS allowances and financial measures to compensate for indirect emission costs incurred from GHG emission costs (Directive 2003/87/EC)) by addressing the risk of carbon leakage in a different way, namely by ensuring equivalent carbon pricing for imports and domestic products. The CBAM is a tool to put a fair price on the carbon emitted during the production of carbon intensive goods that are entering the EU, and to encourage cleaner industrial production in non-EU countries. The gradual introduction of the CBAM is aligned with the phase-out of the allocation of free allowances under the EU ETS to support the decarbonization of EU industry.

The CBAM will in force in its transitional phase as of 1 October 2023. It will initially apply to imports of certain goods and selected precursors whose production is carbon intensive and at most significant risk of carbon leakage: cement, iron and steel, aluminium, fertilizers, electricity and hydrogen.

The CBAM will assess the GHGs emissions released in producing goods and equalize the price of carbon between domestic products and imports of a selected number of products. Hence it will ensure that the EU’s climate objectives are not undermined by production relocating to countries with less ambitious policies.

The CBAM is therefore a climate measure to prevent the risk of carbon leakage and support the EU’s increased ambition on climate mitigation, while

ensuring WTO compatibility. Over a period of eight years, CBAM will also gradually replace the free allowances given under the EU ETS.

4. THE REPUBLIC OF MOLDOVA LEGISLATION FRAMEWORK RELEVANT FOR TRANSPOSITION OF THE EGD ACQUIS

Climate actions are fundamental to the achievement of all 17 Sustainable Development Goals. The draft of the *National Development Strategy “European Moldova 2030”* sets out clear priorities for combating climate change by creating an efficient energy policy, along with a forward-looking climate change policy leading to a fair transition to a climate-neutral and competitive economy by 2030, that will create opportunities for new jobs and sustainable growth at the same time.

The Government of the Republic of Moldova in 2016 approved the main political strategy in the area, *the Low Emission Development Strategy of the Republic of Moldova until 2030 (LEDS) and the Action Plan for its implementation* (Government Decision no. 1470 from 30.12.16).

In 2020, after expressing more ambitious targets for reducing GHG emissions in the updated NDC2, the Republic of Moldova has initiated to develop, but not approved *the Low Emission Development Program of the Republic of Moldova until 2030 (LEDP) and the Action Plan for its implementation*, which is to replace the former LEDS 2030 and to serve as guidance and officially approved document for achieving the targets included in the updated NDC.

The LEDP of Moldova will allow the country to achieve sustainable green development, based on the country’s socio-economic and environmental development priorities, set out in the draft of the National Development Strategy “European Moldova 2030”.

The main political strategy outlining the policies *Environmental Strategy for 2014-2023 and Action Plan for its implementation* (GD no.301/2014) of cross-sector commitment towards sustainable green growth. The strategy's objective of GHG emissions reduction by at least 25% greenhouse gases from the energy sector; by 20% - those from the residential sector, industrial and agricultural sectors; use of 15% biofuels in the transport sector.

Law no. 852 of 14.02.2002 on approval of Regulation on commercial regime and regulation of using halogenated hydrocarbons which destroy the ozone layer sets out the rules of production, import, export, re-export, transit, placing on the market, marketing, use, recovery, recycling and regeneration of halogenated hydrocarbons which destroy the ozone layer.

Law no. 43/2023 on fluorinated greenhouse gases establishes a legal framework, which aims to protect the environment by reducing emissions of fluorinated greenhouse gases. The objectives of the Law are: (i) establishes rules on containment, use, recovery and destruction of F gases, and on related ancillary measures; (ii) imposes conditions on the placing on the market of specific products and equipment that contain, or whose functioning relies upon, fluorinated

greenhouse gases; (iii) imposes conditions on specific uses of fluorinated greenhouse gases; and (IV) establishes quantitative limits for the placing on the market of hydrofluorocarbons.

Taxation of GHG emissions and carbon market Moldova hasn't established carbon market legislative framework.

5. SECONDARY LEGISLATION

The Government Decision no. 444/2020 on establishment of the mechanism for coordinating activities in the field of climate change, establishes organization and operation of: the National Commission on Climate Change through the intersectoral coordination mechanism for coordinating nationally appropriate mitigation activities.

GD no. 483/2019 on approval of the Regulation regarding the training and certification of specialists in the field of cold technology, which contains hydrochlorofluorocarbons and fluorinated greenhouse gases establishes the national training and certification requirements for natural persons (company staff).

GD no. 1242/2016 approving the Regulation on measures to reduce emissions from automotive air conditioning systems, prohibiting charging of motor vehicles with fluorinated gases with a GWP100 greater than 150, except for recharging of air-conditioning systems containing such gases, but which were installed on vehicles before 1 January 2021.

The scope of the GD no. 414/2016 approving the Regulation on reduction in the sulphur content of certain liquid fuels is to reduce the emissions of sulphur dioxide resulting from the combustion of certain types of liquid fuels and thereby to reduce the harmful effects of such emissions on man and the environment.

The *GD no. 1277/2018 on establishment and operation of the National Monitoring and Reporting System for Greenhouse Gas Emissions and Other Information Relevant to Climate Change* regulates monitoring the methane emissions. *GD no.1277/2018* was amended by the *GD no. 358/2021* on modification of the *GD no. 1277/2018* and partially transposes Regulation (EU) 2018/1999 which repealed Regulation (EU) no 525/2013. Amendments concern MRV obligations in conformity with transparency framework requirements of the Paris Agreement (Law no. 78/2017), including on the following articles: art. 7 (1), (aa) and (da), art. 13 (1), (viii) and (ix), art. 14, (1), (ba) and (f) și art. 21. (1).

6. CONCLUSIONS

The main barriers and constraints related to aligning the national legislation with the EU and EnC Treaty Decarbonization Roadmap commitments are the lack of institutional, technical and financial capacities.

A gap analysis was performed in the Republic of Moldova in 2020 by EU4Climate Project against the EU acquis on Climate Actions and a Roadmap for

legislative alignment has been developed with support of EnC Secretariat, elaborated by the Comendant (2020).

The gap analysis against the EU acquis on climate actions and the roadmap for EU4Climate support outlining priority actions for the Moldova, revealed that, there were three EU climate change acquis in the frame of EU-RM Association Agreement (AA) and one EnC recommendation in the frame of Energy Community Treaty, which have not yet transposed into national legislation:

- EU Regulation 517/2014 (F-gases) – deadline for transposition: 2018;
- Regulation (EC) No 1005/2009 (Ozone Depleting Substances) – deadline for transposition: 2019;
- Recommendation 2018/01/MC-EnC (NECP) – deadline for implementation: 2020;
- Directive 2003/87/EC (Emission Allowance Trading) – deadline for transposition: 2022.

Considering the transposition deadline, all legal acts required to undertake not delayed actions to transpose them into national legislation, so all respective acquis have been treated as priority actions under the capacity building programme supported by the EU4Climate Project. However, due to limited resources available, within the 2020-2022 periods, the capacity building activities have been focused on preparing the draft Law on F-gases (process finalized), respectively on transposing the Directive 2003/87/EC (it has been drafted a GD on approving the Regulation on MRV of GHG emissions from stationary installations, which partially transpose the Directive 2003/87/EC).

There are some technical impediments on transposition of the EU climate Acquis due to the law-making procedure:

- all legislative drafts should be based on primary legislative justification, but we underline that there are no provisions on climate change mitigation and adaptation in primary legislation, which creates some impediments in promoting new administrative procedures, like a carbon tax etc.;
- the administrative procedure incorporated in the secondary legislation, without clear imperative norms in primary legislation, creates an inefficient and low application, for, ex. low data accessibility in implementation of the GD no.1277/2018 on establishment and operation of the National Monitoring and Reporting System for Greenhouse Gas Emissions and Other Information Relevant to Climate Change;
- the implementation mechanism of transposed in legislation the EU standards are no efficient due to lack of new secondary legislation elaborated in time;
- the implementation mechanism of transposed in national legislation the EU standards are no efficient due to lack of new sanctions incorporated in time in the Contravention Code No. 218/2008 and Criminal Code 985-XV/2002.

We underline the necessity of elaboration the new Climate Actions Law, which will consolidate of adopted legal framework on: i) mitigating and adaptation policy actions; ii) inter-institutional coordination; iii) MRV and National Inventory System and will create the legal framework in enhancing the management of greenhouse gas emissions inventory system (inclusive the carbon pricing system).

In the above - mentioned proposals we recommend the following:

1. Elaboration of a draft Law on Climate Change, the law is expected to include references on achievement of climate neutrality objective by 2050 and the intermediate target of reducing net and the GHG emissions by sectors by 2030; the law should also introduce measures for a binding target for carbon sink up to 2030 as a significant contribution to the climate neutrality pathway; furthermore, it is expected contributing to climate impact quantification and adaptation planning to boost resilience of Moldova's community and economy;

2. Elaboration of the Regulation on carbon pricing, to be approved by a Governmental Decision;

3. Amending the Governmental Decision No. 373/2018 on National Register of emissions and pollutant transfer, to enhance the application of monitoring, reporting and verification of emissions from stationary installations and aviation activities; if amendment is approved, it will transpose Article 19 'Registries' of the Directive 2003/87/EC;

4. Elaboration of the Regulation on monitoring, reporting and verification of emissions from stationary installations and aviation activities, to be approved by a Governmental Decision, partially transposing the MRR Regulation – Commission Implementing Regulation (EU) 2018/2066 on the monitoring and reporting of greenhouse gas emissions, amended by Commission Implementing Regulation (EU) 2020/2085; if approved, the Regulation will transpose Article 14 'Monitoring and reporting of emissions', Article 17 'Access to information', as well as Annex I 'Categories of activities to which this directive applies' and Annex II 'Greenhouse gases to which this directive applies' of the Directive 2003/87/EC;

5. Elaboration of the Regulation on the verification of data and on the accreditation of verifiers, to be approved by a Governmental Decision, transposing the AVR Regulation – Regulation (EU) 2018/2067 on the verification of data and on the accreditation of verifiers, amended by Commission Implementing Regulation (EU) 2020/2084; if approved, the Regulation will transpose Article 15 'Verification and accreditation' of the Directive 2003/87/EC;

6. Amending the Contravention Code for a series of illegal actions or inaction, transposing Article 16 'Penalties' of the ETS Directive 2003/87/EC;

7. Amending the Law No. 235 of 01.12.2011 on accreditation and conformity assessment, to delegate to the National Accreditation Center of the

Republic of Moldova the accreditation of verifiers to perform the verification in line with the AVR Regulation.

ACKNOWLEDGMENTS

The authors acknowledge the co-financed support by the European Commission, European Education and Culture Executive Agency (EACEA), Chair Jean Monnet on EU Studies for Human Rights Protection and Alternative Dispute Resolution, Grant Agreement number: 101085276 — EU4JUST — ERASMUS-JMO-2022-HEI-TCH-RSCH. Views and opinions expressed are however those of the authors only and do not necessarily reflect those of European Union or European Commission (EACEA). Neither the European Union nor the granting authority can be held responsible for them.

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EUFIRE 2023

European Financial Resilience and Regulation

This volume is the result of the research carried out within the Jean Monnet centre of Excellence European Financial Resilience and Regulation, and reunites the papers presented at the International Conference „European Financial Resilience and Regulation – EUFIRE 2023”, organized at „Alexandru Ioan Cuza” University of Iasi, in May 2023. In the extraordinary context of the global post-pandemic Covid-19 crises and the war in Ukraine, the conference was organized using the on-line and on-site format and it reunited an impressive number of researchers, academics, and practitioners. Through its interdisciplinary contents, the volume approaches different aspects of the financial, business, and public administration regulatory framework in the European Union, especially focusing on its dynamics, recent developments, deficiencies and means of reinforcement, given the current global challenges.

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ISBN *online*: 978-606-714-784-1
<http://eufire.uaic.ro>

EDITURA UNIVERSITĂȚII „ALEXANDRU IOAN CUZA” DIN IAȘI