

MIHAELA TOFAN
IRINA BILAN
ELENA CIGU
(EDITORS)

EUFIRE 2022

European Finance,
Business and Regulation.
Challenges
of Post-Pandemic Recovery

EDITURA UNIVERSITĂȚII „ALEXANDRU IOAN CUZA” DIN IAȘI

Mihaela Tofan • Irina Bilan • Elena Cigu

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Scientific advisors:

Professor Ph.D. Alin Marius Andrieș

Associate Professor Ph.D. Cosmin Flavius Costăș

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Director: prof. univ. dr. Constantin Dram

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2022

Mihaela TOFAN is full professor at Alexandru Ioan Cuza University of Iași, Faculty of Economics and Business Administration - Department of Finance, Money and Public Administration and litigant lawyer. She has a degree in legal sciences from the Law Faculty of Alexandru Ioan Cuza University of Iași (1999), PhD. in legal sciences from the University of Bucharest (2008) – Faculty of Law and habilitation in administrative science from Babeș-Bolyai University of Cluj-Napoca. She is Professor Jean Monnet, director of the Jean Monnet Chair European Financial Regulation EUFIRE (eufire.uaic.ro) and member of the Center of Excellence in European Studies, within Alexandru Ioan Cuza University of Iași. She is Fulbright alumni, Emile Noel Senior Fellow at the New York University School of Law (2019), ERASMUS professor and invited guest for research and teaching at universities in Italy, Turkey, Cyprus, Portugal, France, United Kingdom, Spain, Czech Republic, Poland, Ukraine, Republic of Moldova, Iceland, Israel, United States of America and Germany. She is the author, co-author and editor of 20 volumes and 65 articles in volumes and journals indexed in international databases. Her expertise areas are EU Law, tax harmonization and Business Law.

Irina BILAN holds a PhD. in Finance from the Faculty of Economics and Business Administration, Alexandru Ioan Cuza University of Iași. She is currently associate professor at the Department of Finance, Money and Public Administration, within the same faculty. Her area of expertise includes public finance, international finance, and money and banking systems. She performed research and documentation visits at Paris Dauphine University (France, 2010), University of Poitiers (France, 2015), University of Bolton (the United Kingdom, 2018), University of Zaragoza (Spain, 2018) and University of Michigan-Flint (the USA, 2019), and taught within the Erasmus programme in Italy, Turkey, Kazakhstan, Belgium, Spain, Morocco, Kyrgyzstan, Egypt, Croatia and Vietnam. She attended training programs on the subject of “Management of tertiary activities” (2011), “SAP, ERP and School Management” (2011-2012), “Didactics of teaching humanities” (2012), “Panel data econometrics” (2018). She published as an author or coauthor a book, several book chapters, and more than 70 papers in journals indexed in international databases or volumes of national and international conferences.

Elena CIGU, PhD. (in Finance), is associate professor at the Faculty of Economics and Business Administration of Alexandru Ioan Cuza University of Iași, Romania. She researches in the field of European studies since 2004, on local tax law, and in the field of Public Administration since 2004, on local administrative and financial autonomy in the EU countries. Her research involved a postdoctoral fellowship on financial autonomy and implications on the sustainable development of local communities in the knowledge society. She had research mobilities at the University of Bolton (the UK) and at the University of Parma (Italy). She authored and co-authored 10 books, along with over 40 articles published in journals indexed in international databases, 60 articles published in conference proceedings, and attended over 70 international conferences. She has experience in project management as director or member in several structural and research projects (such as Erasmus+, Erasmus Mundus, POSDRU, POCU, UEFCSDI, CEEX), in the organizing committee of 10 international conferences and in international teaching through Erasmus and Erasmus+ programmes. Her teaching activities have focused so far on local public finance and public administration.

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E-SERVICE RECOVERY ON CONSUMER'S BEHAVIORAL INTENTIONS: APPLIED STUDY ON MEDIATING EFFECT OF POST-RECOVERY SATISFACTION FOR CUSTOMERS OF ROMANIA'S BANKING SECTOR

ATTIA ABDELKADER ALI

*Alexandru Ioan Cuza University of Iași
Iași, Romania
attiaali@aun.edu.eg*

Abstract

The proliferation of banking and financial services technology-driven initiatives has resulted in a dizzying array of systems services failures. Consequently, banks must prioritize e-service recovery to achieve optimistic consumers' behavioural intentions and e-service recovery satisfaction.

This research adds to theory and practice by assessing the relationship between online service recovery and customers' behavioural intentions with the mediating influence of post-recovery satisfaction. The relationships between study variables were statistically tested in a quantitative online questionnaire on a Likert scale of five points. Simple and multiple regression analyses were conducted on data collected from 325 respondents who were e-banking customers in Iasi, Romania, and who reported experiencing an online banking service failure. The findings reveal that only two dimensions of e-service recovery (interactional and procedural justice) positively influence post-recovery satisfaction and customers' behavioural intentions. The interactional justice was the most influential predictor of the variance in post-recovery satisfaction and customer behavioural intentions. Distributive justice has no effect on post-recovery satisfaction and behavioural intentions. The results further showed that post-recovery satisfaction mediates the relationship between e-service recovery and customers' behavioural intentions. This study provided specific recommendations to Romanian banks on managing and operating the e-online services that are delivered to their customers to increase post-recovery satisfaction and consumer behavioural intentions. The research emphasizes the vital of service recovery in the e-banking context and the importance of investing in marketing practices and campaigns to increase consumers' positive attitudes toward banks. Additionally, it emphasizes the importance of procedural and interactional recovery justice and the need to handle both in the process of successfully e-service recovery.

Keywords: *E-service recovery; service failure; consumers satisfaction; behavioural intentions.*

JEL Classification: M31, G21

1. INTRODUCTION

The banking industry's critical position in the financial sector has attracted considerable interest recently and has been the subject of academic and policymaker scrutiny. Due to evolving consumer needs and rising technological advancements, banks cannot further rely on conventional customer satisfaction approaches. Financial services have changed a lot since SSTs (Self-Service Technology), e-banking, and other technology-based banking initiatives were introduced (Yee-Loong Chong *et al.*, 2010). The improvements brought about by customers' greater use of technology due to growing Internet penetration, and smartphone usage provides significant difficulties and challenges for banks in various ways (Reis, Amorim and Melão, 2019). Due to consumers' changing attitudes and behaviours, e-service has quickly become the preferred method for service providers and customers. Due to these advancements, traditional banking services have changed, and banks are increasingly using e-services to expand their significant customer base and income (Fonseca, 2014). As a result, bank rivalry has expanded to encompass Internet banking, e-services, and conventional banking (González *et al.*, 2004; Brun, Durif and Ricard, 2014).

In practically every facet of customer service, banking has undergone enormous changes. Recent reports show a shift in focus away from client acquisition and toward establishing innovative tactics to minimize customer defections. Service failures are common in all service contexts, and their frequency is rising because of an overreliance on innovative technical tools to provide appropriate and timely service. The growth of technology-enabled activities has resulted in various system-related service breakdowns. Many obstacles are outside the control of the service provider, so appropriate service recovery solutions are critical for regaining customer satisfaction. A lack of service may have a negative influence on customers' loyalty intentions, customer happiness, and the profitability of service firms, according to empirical research (Rejikumar, G. 2015; Petzer, De Meyer-Heydenrych and Svensson, 2017).

Obtaining a new customer has often been around five times the price of keeping current customers. Consequently, customer retention is dependent on successful responses to service failures. While banks aim to offer error-free electronic services, errors are inevitable with conventional technology-based self-service choices (Meuter *et al.*, 2000; Collier *et al.*, 2015). Unexpected factors and variables influence the bank-customer relationship, e.g., platform failures, equipment breakdowns, client technical skill levels, etc. (Michel, 2004). Service breakdown occurs when a service's performance falls short of the customer's expectations and demands when an issue happens in a physical intermediate, it is known as an e-service failure (Tarofder *et al.*, 2016).

Service failures that cannot be avoided if not appropriately handled lead to severing the connection between the service provider and consumers (Jun and Palacios, 2016). Consumer dissatisfaction is the consequence of such service

breakdown, and as a result, the consumer may choose to terminate their association with the service supplier (Piha and Avlonitis, 2015; Thaichon *et al.*, 2017) and negative WOM (Soares *et al.*, 2017; Harun *et al.*, 2019). E-services are efforts that facilitate the provision of services via technology (Rowley, 2006). The banking sector confronts a challenge in managing its clients' transition to e-services since errors in the provision of e-services are inescapable (Reis, Amorim and Melão, 2019).

Additionally, empirical studies indicate that expectations for e-services performance have gone through a quantum leap (Featherman and Hajli, 2016; Jouzdani *et al.*, 2020), and consumers' tolerance for technical service failures is diminishing (Mathew, Jose and Chacko, 2020). Thus, the bank managers must evaluate the future of banks and the resources necessary to establish and maintain supremacy in this dynamic market at the forefront of e-service delivery. E-service recovery could be seen as a response to customer complaints from a service provider about perceived service failures (Van Vaerenbergh *et al.*, 2019; Albrecht *et al.*, 2019). E-services recovery may take three forms: interactional justice, distributive justice, and procedural justice (La and Choi, 2019; Wu, Du and Sun, 2020; Babin, Zhuang and Borges, 2021).

Distributive justice is a term that refers to the worth of justice in terms of the division of expenses and benefits experienced by consumers. Procedure justice is the value of justice that comes from the complaint process's reliability. In contrast, interactional justice indicates the quantity of fairness felt by customers due to their interactions with employees throughout the complaint recovery process (Bacile *et al.*, 2018; La and Choi, 2019; Babin, Zhuang and Borges, 2021). Additionally, service recovery may be quantified via online service recovery characteristics. Responsiveness is a service provider's ability to react rapidly to client concerns. Compensation is a service provider's effort to compensate consumers for service failures. In contrast, contact is the capacity of a service provider to interact with consumers during service interruptions (Kandulapati and Bellamkonda, 2014).

Considering the significance of the service recovery procedure for both customers and service organizations, this concept has attracted the attention of many researchers. In the setting of providing offline services, the issue of service recovery has been studied from several aspects, such as determinants and results, customer satisfaction with recovery, customer loyalty, switching costs, purchasing intentions, and positive WOM (Tax, Brown and Chandrashekar, 1998; Smith, Bolton and Wagner, 1999; Michel and Meuter, 2008; Gelbrich and Roschk, 2011; Chih *et al.*, 2012; Chiu, Chou and Chiu, 2013; Augusto de Matos, Luiz Henrique and de Rosa, 2013). On the contrary, it may find that the online service failure can impact service organizations and their brands more than the offline service failure since customers complain more via the Internet (Holloway and Beatty, 2003).

Electronic channels simplify the filing of complaints since they reach a large geographical audience. Additionally, switching online is more convenient than switching offline since an alternate search is just a click away. Based on the above, an organization must understand how to handle e-service recovery successfully. The existing literature on e-services has examined various issues, including e- service failure and solutions recovery, perceived justice's role, e-service failure management, pre-recovery contentment and emotions, and customer loyalty upon service recovery (Singh and Crisafulli, 2016; Ozkan-Tektas and Basgoze, 2017; Azemi *et al.*, 2019; Chao and Cheng, 2019; Mathew, Jose and Chacko, 2020).

Despite recent advancements in this field of study, there are still areas for improvement, notably in the online banking industry, specifically in comprehending online service recovery and perceived justice influence and customer behavioural intentions. While consumers have a bad experience with recovery, they may become unsatisfied and exhibit certain behaviours toward the organization (Chao and Cheng, 2019). The empirical study on e-service recovery in e-banking is relatively scarce. Therefore, practitioners would be interested in the role of post-recovery satisfaction in the relationship between e-service recovery and customer conduct intentions. This theoretical approach lets us capture the customer's perception of justice after an E-recovery campaign. However, practical research on customers' perspectives on electronic failure recovery is remarkably few, even though offline and online service failures are an inevitable component of the service sector, especially in the Romanian environment. Internet service interruptions may significantly affect customer satisfaction and consumer actions.

As far as the researcher is aware, this study was not applied to the same variables in the e-banking sector in Romania. According to the above, the current research will examine the effect of e-service recovery on consumers' behavioural intentions with the mediating influence of post-recovery satisfaction: An applied study on customers of Romania's banking sector.

2. BACKGROUND AND HYPOTHESES FORMULATION

At the start of the COVID-19 crisis, the Romanian banking system was relatively stable compared to the EU average but faced significant delays in implementing digital banking. The epidemic drastically altered Romanian consumers' behavior, with statistics indicating a considerable fall in cash use and a corresponding rise in confidence in digital banking services. The health issue has functioned as a driver for collaboration between Romanian banks and FinTech startups, allowing for more opportunities for exploration and development of fewer potentially dangerous goods.

Romanian consumers and credit institutions benefit from digital banking because it provides tailored goods in a more comfortable and flexible

environment. Accurate digitalization of the financial sector requires digital skills and corporate integration of digital technologies. Romania is ranked 26th in the Digital Economy and Society Index (DESI) 2021, out of 28 EU Member States, and scores best on the connectivity component. The total human capital score was 33.2 (the EU average was 49.3), and 31% have at least basic technological skills.

Prior studies on internet service failures have noted that most consumers feel wronged after a firm's recovery attempts. Specifically, it states that online consumers cited in-service failures in interactional, distributive, and procedural fairness (Holloway and Beatty, 2003). According to Tax, Brown and Chandrashekar (1998), justice theory results indicated that service recovery could be applied to both electronic and offline settings. The current research that deals with the recovery of the offline service are closely related to the online services. Therefore, the research and study on the failure of the service provided via the Internet should not be ignored. E-service recovery comprises three first-order dimensions defined by Tax, Brown and Chandrashekar (1998): procedural, interactional, and distributive fairness. Interactional fairness online relates to a customer's ease of use to find and talk to technical help providers on a website and how a company's employees interact with the customer. Examples of interactional justice via the Internet include online training, FAQ, and interaction via email.

Additionally, it provides simple access to the telephone numbers of firm representatives that may help the consumer. Interactional fairness in service recovery may change a customer's satisfaction throughout the transaction. Procedural fairness refers to the rules, techniques, and response of the complaint process, the refund policy of a corporation, the buyer's rights in the event of incorrect costs, and the speed, which an issue may be remedied.

Distributional justice pertains to justice of the final outputs and the compensation provided by the company to the customer in exchange for the failure that occurred in the service provided. This area significantly influences service quality evaluations since, in the customer's opinion, "justice delayed is justice denied" (Tax, Brown and Chandrashekar, 1998). The research is founded on well-known principle of fairness by Homans and Merton (1961), a model often used in service recovery studies. In a recovery setting, consumers assess the firm's fairness in giving compensation (distributive justice), fixing the service errors (procedural justice), and customer-service providers (interactional justice). Following service breakdown and recovery, several studies have been undertaken on the consumer's perception of fairness (Tax, Brown and Chandrashekar, 1998; Smith, Bolton and Wagner, 1999; Chebat and Slusarczyk, 2005; Del Río-Lanza, Vázquez-Casielles and Díaz-Martín, 2009).

2.1. E-service recovery and customers' behavioural intentions

Recovery efforts are critical for retaining current consumers and gaining new ones via excellent word of mouth. The fundamental question should be, "which sorts of recovery operations efficiently overcome service failures?" In the context of service failure, previous research has explored the impact of the justice component on post-recovery satisfaction and consumer intentions. Blodgett, Hill and Tax (1997) investigated the impacts of interactional, distributive, and procedural justice on consumers' desire for patronage and their intention to Generate positive WOM. The study examined several recovery scenarios (low–medium–high) according to the three components of justice to explore how each aspect of justice with various levels of consumer recovery impact their behavioural intentions. According to the study, the impact of perceived justice on customer behavioural intentions differs based on the various components of justice and the extent of service recovery attempts. Similarly, Ok, Back and Shanklin (2005) studied the impact of fairness and recovery satisfaction on positive behavioural intentions, including the desire to return and the readiness to recommend found that perceived fairness increases healing and overall satisfaction, resulting in positive behavioural intentions.

Due to the unavoidability of service failures, service recovery is essential. Consequently, improper handling of service complaints may result in bad WOM and decreased repurchase intentions (Tax, Brown and Chandrashekar, 1998). Additionally, consumers do not understand or accept the injustice of service failure recovery (Blodgett, Hill and Tax, 1997). However, when service providers give refunds or discounts to compensate for a service failure and manage the matter courteously, they might boost their consumers' likelihood of repurchasing (Seiders and Berry, 1998). A higher perceived fairness of service recovery corresponds with a bigger incentive for good WOM, according to research on service failure in e-retailing. A higher perceived justice is associated with a greater repurchase intention (Maxham and Netemeyer, 2002). It was also shown that consumers' post-purchase intentions are positively affected by their perception of fairness (Ha and Jang, 2009).

Customers that focus on the e-service recovery process are more likely to make future purchases and engage in future co-creation, according to the research literature (Guo *et al.*, 2016). First, if consumers think they are the most important part of the process, they will feel more important, which will make the process fairer (Guo *et al.*, 2016). Consequently, they become an integral service provider component, and their repurchase intent is suggested (Park and Ha, 2016; Hazée, Van Vaerenbergh and Armiroto, 2017). Secondly, when distributive fairness rises, the urge to repurchase will grow after consumers have received compensation that meets their expectations (Roggeveen, Tsiros and Grewal, 2012). Customers who see distributive justice have trust in the service provider's ability to supply a satisfactory product notwithstanding a service

failure (Gohary, Hamzeli and Pourazizi, 2016; Nadiri, 2016). Thirdly, customers who encounter a smooth service recovery and see participatory justice are more likely to use the same service in the future, hence increasing repurchase and behavioral intentions (Vázquez-Casielles, Iglesias and Varela-Neira, 2017). Therefore, based on this explanation, the first study's hypothesis is formed:

H1: "E-service recovery (distributive, procedural, interactional) has a positive impact on customers' behavioural intentions."

2.2. E-Service recovery and post-recovery satisfaction

Earlier research has shown that justice expectations strongly predict consumer satisfaction (Chiu, Chou and Chiu, 2013; Ding and Lii, 2016). According to Parasuraman, Berry and Zeithaml, (1991), efficient service recovery may increase consumers' perception quality of purchased goods or services, the enterprise's capability, the organization's image, and ultimately post-recovery satisfaction. The research is founded on the well-known theory of justice (Homans and Merton, 1961), a framework that is often utilized in service recovery research (Tax, Brown and Chandrashekar, 1998; Smith, Bolton and Wagner, 1999; Chebat and Slusarczyk, 2005; Del Río-Lanza, Vázquez-Casielles and Díaz-Martín, 2009).

Perceived fairness emerged from the legal dispute studies resolution, and its components include the following (Thibaut and Walker, 1978). Procedural fairness pertains to public perceptions of the fairness of the methods used to generate outcomes. In the scenario of service recovery, procedural fairness relates to the consumers' perception of the company's fairness in addressing the service problem (or unfair). Procedural fairness has been widely studied in offline service recovery interactions. Customers express a sense of procedural fairness when recovery methods are flexible in this situation (Tax, Brown and Chandrashekar, 1998; Chebat and Slusarczyk, 2005; Del Río-Lanza, Vázquez-Casielles and Díaz-Martín, 2009; Karatepe, 2006). Perceptions of fairness, in turn, resulted in consumer satisfaction and intent to frequent the business, generating positive word of mouth (PWOM) (Smith, Bolton and Wagner, 1999; Maxham and Netemeyer, 2002). By contrast, little study has examined consumer views of fairness recovery in online service and recovery interactions.

Customer responses to offline fairness-based service recovery alternatives have been investigated in this arena, even after e-service failures. For example, Shapiro and Nieman-Gonder (2006) investigate the function of compensation and apologies in the aftermath of internet service failures. Simultaneously, providing pertinent insights into the persons and combined interactional and distributive fairness consequences. Several studies dealt with the link among the justice aspects in the service recovery context, whether online or offline and some other variables, such as customer satisfaction with recovery. These studies verified consumer impressions about the three-justice components after the

failed online service submission and demonstrate the significance of consumers' perceptions of fairness during service recovery by providing compensation or using online help pages, FAQs, and website instructions regularly by companies when seeking to resolve online service difficulties. These online recoveries should allow for a quick and flexible resolution of online service failures to a positive post-recovery satisfaction (Lin, Wang and Chang, 2011; Villi and Koc, 2018).

Previous studies applied to a service failure in an offline environment concluded that service providers' interactions, civility, and kindness are considered the essential parts of interactional fairness and positively impacts consumers satisfaction with recovery (Tax, Brown and Chandrashekar, 1998; Chebat and Slusarczyk, 2005; Gelbrich and Roschk, 2011). This collection of studies demonstrates a solid empirical case for the beneficial effect on customer satisfaction of the perceived fairness communicated by offline service recovery attempts (Blodgett, Hill and Tax, 1997; Smith, Bolton and Wagner, 1999; Ali and Mohamed, 2020). However, the research has ignored the significance of interactional fairness in e-service failures. Several studies have evaluated consumer preference for various ways of contacting the company after e- service failures.

The perceived justice dimensions supplied through email conversation, help pages, and compensation are critical for resolving consumer complaints about online service failures and positively impacting post-recovery satisfaction. Shapiro and Nieman-Gonder (2006) concluded how the interactional, procedural, and distributive fairness provided by the above types affects post-recovery satisfaction in further detail. According to the same research, email communication results in lower customer satisfaction when compared to in-person or telephone conversations. These writers, however, analyzed service failures that occurred offline rather than online. In e-service failure setting, Lin, Wang and Chang (2011) aimed to determine the effect of perceived justice on post-recovery satisfaction and behaviour. The study concluded that interactional justice and procedural justice are positively correlated with post-recovery satisfaction, and the online interactions between the customers and service providers have a higher impact than the service recovery procedures.

However, the mentioned research does not consider how online technology-mediated interactions between consumers and staff occur online (Mazaheri, Richard and Laroche, 2012). The technology construction may affect how customers perceive recovery. The importance of technology-mediated interactions and procedures and compensations in service recovery encounters and associated views of interactional, distributive, and procedural fairness has been ignored. The current research contributes to existing studies by analyzing the impact of interactional, procedural, and distributive justice as communicated via technology-mediated interactions. The link among e-service recovery and

customer post-recovery satisfaction is well-established conceptually. Managing service failures effectively will result in increased customer satisfaction. Numerous prior research has studied the link among e-service recovery and post-recovery satisfaction. The overwhelming experimental methodology reveals a substantial correlation between the two (Kuo and Wu, 2012; Kandulapati and Bellamkonda, 2014; Singh and Crisafulli, 2016; Jung and Seock, 2017; Ibrahim, Abdallahamed and Adam, 2018; Albrecht *et al.*, 2019; Odoom, Agbemabiese and Hinson, 2019; Chao and Cheng, 2019; Wu, Du and Sun, 2020; Chang and Cheng, 2021). Based on this explanation, the study's second hypothesis is formed:

H2: "E-service recovery (distributive, procedural, interactional) has a positive impact on consumers' post-recovery satisfaction."

2.3. Post-recovery satisfaction and customers' behavioral intentions

The reciprocity norm's theoretical explanation shows the association between customer post-recovery satisfaction and behavioral intentions (Gouldner, 1960). Based on the standard, consumers are disposed to assist people who have assisted them. Previous research indicates that consumers feel responsible for repaying a corporation when service recovery accomplishes justice (Van Vaerenbergh *et al.*, 2019). For example, when consumers get a positive connection with a business, they have fewer inclinations to seek retribution when given a fair service recovery instead of an unfair one. The customer is willing to give the company what it deserves during service recovery (Grégoire, Tripp and Legoux, 2009). Previous research on offline service recovery illustrated a positive correlation between customer post-recovery satisfaction and some positive behavioural intentions (Blodgett, Hill and Tax, 1997; Wallin Andreassen, 2000; Maxham and Netemeyer, 2002). The customers are willing to repurchase and promote the company if they are pleased with the offline service recovery procedure (Holloway, Wang and Parish, 2005).

The behavioural consequences for customers are highly influenced by customers' perceptions of how well the service was restored method chosen. Satisfied consumers may share good remarks about the business and its products and services and suggest the business to others. Satisfied customers may significantly influence if they spread pleasant word-of-mouth and sometimes attract new diners (Bearden and Teel, 1983). This trend is especially plausible for an Internet business since the Internet's breadth, and depth of reach exceed those of conventional WOM communication. Additionally, customers who are satisfied create a high frequency of purchases. They are more likely to stay loyal to a business, repurchase or increase their spending, and are willing to pay extra (Zeithaml, Berry, and Parasuraman, 1996).

In this context, many studies (Bearden and Teel, 1983; Hoffman and Kelley, 2000; Kim, Kim and Kim, 2009; Huang, 2011; Lastner *et al.*, 2016;

Rambocas, Kirpalani and Simms, 2018; Tsao, 2018; Weitzl and Hutzinger, 2019; Piha and Avlonitis, 2015; Dandis *et al.*, 2021) explored the association between post-recovery satisfaction and their future behavioural intentions toward service providers. The study indicated a clear and statistically significant correlation between post-recovery satisfaction, customers' future behavioural intentions, and the intention to file a future complaint to fix the service failure. In addition, it found a significant negative association between post-recovery satisfaction and bad Word of mouth (WOM), customer price sensitivity, and willingness to switch service providers. Moreover, by giving a good service recovery, banks may increase clients' behavioural intentions or decrease their hatred against their brand, enhancing customer service satisfaction. Thus, based on earlier study results, the author proposes that customer satisfaction positively influences their behavioural intentions toward their bank, such as offering positive feedback to other customers or prolonging their participation with the organization. Hence, based on this explanation, the third study's hypothesis is formed:

H3: "Post-recovery satisfaction has a positive impact on consumers' behavioural intentions."

2.4. E-service recovery and post-recovery satisfaction and customers' behavioural intentions

Several studies have indicated that satisfied consumers are willing to demonstrate positive behavioural responses such as positive WOM, repurchase intentions, and loyalty in the marketing literature (Kau and Wan-Yiun Loh, 2006; Petzer, De Meyer-Heydenrych and Svensson, 2017; Wang, So and Sparks, 2017; Rambocas and Ramsubhag, 2018; Tanner-Smith *et al.*, 2018). Procedural, distributive, and interactional justice, as a dimension of offline service positively, impacts post-recovery satisfaction. The study found there was no indication of a connection between bad WOM and patronage intentions and how justice is viewed in the community. Given the context, it is probably one of the most important things that leads to post-recovery behaviour intentions. Therefore, distributive, interactional, and procedural justice dimensions impacts behavioural intentions through post-recovery satisfaction. According to Ajzen, (1991), behavioural intentions are influenced by motivating variables, the more substantial the intention to engage in conduct, the greater the likelihood that the behaviour will occur.

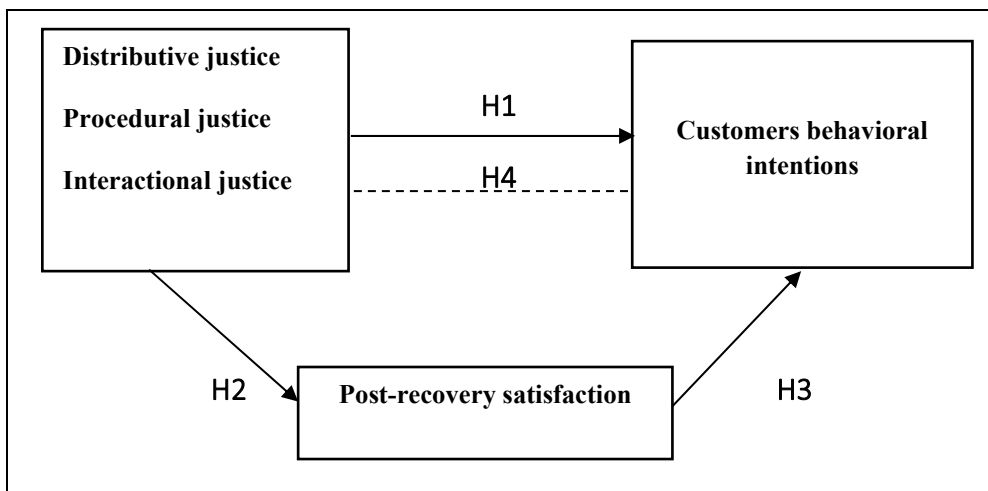
In contrast, fairness theory is primarily acknowledged for understanding recovery satisfaction and its effects following service failure (Smith, Bolton and Wagner, 1999; Chebat and Slusarczyk, 2005; Ha and Jang, 2009; Cheung and To, 2017). Post-recovery satisfaction is the primary determinant of customer loyalty and intent (Jung and Seock, 2017), and proven satisfaction with healing precedes good WOM. Yet, Bouranta, Psomas and Vouzas (2019) show that high

service recovery rate correlates with improved customer loyalty and purchase intent. Recovery satisfaction seems to be a prerequisite for establishing consumers' behavioural intentions in reaction to perceived unfairness. Many previous studies (Wirtz and Mattila, 2004; Lin, Wang and Chang, 2011; Ellyawati, Purwanto and Dharmmes, 2012; Kuo and Wu, 2012; Nikbin *et al.*, 2015) dealt with direct relationships among e-service recovery and post-recovery satisfaction and show that dissatisfied customers will spread unfavourable WOM and choose other options. The perception of customer fairness to the efforts made by the company for service failure recovery contributes to high satisfaction levels. Some other studies (Cambra-Fierro *et al.*, 2011; Augusto de Matos, Luiz Henrique, and de Rosa, 2013; Singh and Crisafulli, 2016) show strong favourable associations between post-recovery satisfaction and future behavioural intentions. Based on the above, it is anticipated that post-recovery customer satisfaction will serve as a mediation between E-service recovery and future behavioral intentions and thus the fourth study's hypothesis is formed:

H4: Post-recovery satisfaction has a mediating effect in the relationship between e-service recovery and customers behavioral intentions".

The link between e-service recovery, which consists of three aspects (procedural, distributive, and interactional), customers' behavioural intention, and the mediating effect of post-recovery satisfaction in the context of the failure of e-banking is shown in Figure 1, offering a comprehensive overview of this study's conceptual context, the suggested study model, and the tested essential relationships.

Figure 1. The proposed conceptual Model



Source: author's design and concept

3. MATERIAL AND METHODS

The present research intends to establish the degree of customer satisfaction with e-service recovery justice among customers who have encountered failure in e-banking while using self-service technologies such as mobile banking services, ATMs, or Internet banking. Iasi city has been picked as the survey location since it is a large city in Romania with a mix of public and private bank branches. Due to the inability to identify the study target population size, the sampling procedure was non-probabilistic. Therefore, the researcher attempted to contact as many members of this demographic as possible. A structured web-based questionnaire was used to gather the data from 325 participants.

The target group for this research was male and female university students in Iasi city, as the youth group is the most used group for electronic banking services. The same authors assert that "younger individuals are more receptive to digital developments." (Schipor and Duhnea, 2020), becoming the central pillar of exploring the students' perceptions of digital banking services in Romania. In line with this finding are also the studies of Choudrie and Vyas (2014) and Choudrie *et al.* (2018) suggesting low levels of digital banking adoption by older adults using electronic services among the Romanian consumers in retail banking. Respondents were asked to ascertain whether they have discovered faults or issues with the electronic services supplied by banks and the frequency with which these issues occur.

On a five-point Likert scale ranging from (1) "strongly disagree" to (5) "strongly agree," the responses were collected. The research instrument items were developed from already existing instruments referenced in marketing literature. E-service recovery was measured using 12 items: four items measured distributive justice derived from, and 4 items measured procedural justice derived from (Blodgett, Hill and Tax, 1997; Smith, Bolton and Wagner, 1999; del Río-Lanza, Vázquez-Casielles and Díaz-Martín, 2009). 4 items measured interactional justice in Blodgett, Hill and Tax (1997) and Lin, Wang and Chang (2011).

Moreover, 4 items were used to measure post-recovery satisfaction adapted from Lin, Wang and Chang (2011) and Del Río-Lanza, Vázquez-Casielles and Díaz-Martín (2009), besides used 4 items to measure customers' behavioral intentions adapted from Wong and Sohal (2002), Mattila (2001), and Maxham and Netemeyer (2002). The instrument is split into two sections. The first component of the survey consisted of the demographic data of age, gender, and level of education. The responders' profile implies that they are young and well-educated. In the second component, 20 items pertinent to capturing the variables of interest to the research were added.

Although the researcher is based on objective and valid measures when developing the study variables to assess the scale's reliability and validity, it was essential to examine the instrument's soundness before distributing it to the

respondents. Cronbach's alpha, an outstanding measure of the questionnaire's validity and reliability, was used, and as the scale approaches +1, it gets more accurate. Using simple regression analysis and multiple linear regression analysis (stepwise), the research hypotheses were examined, using descriptive statistical approaches to describe the features of the sample s. The data were analyzed on a computer using a program (SPSS v25).

Table 1 shows the questionnaire list's validity and reliability tests.

Table 1. The validity and reliability of the questionnaire

Research instrument	Cronbach's alpha	References
E-service recovery	0.859	
Distributive justice: <i>Reflective construct with 4 items</i>	0.713	Ha and Jang, 2009; Chuang <i>et al.</i> , 2012; Ding and Lii, 2016
When there was a problem with the bank's online service, I was fairly compensated by the bank.		
The outcomes I got from the bank in reaction to the online service failure have been satisfactory.		
I believe that my issue was resolved correctly.		
The bank provided me with everything I needed to resolve the issue using their online service.		
Procedural justice: <i>Reflective construct with 4 items</i>	0.727	Blodgett, Hill and Tax, 1997; Smith, Bolton and Wagner, 1999; del Río-Lanza, Vázquez-Casielles and Díaz-Martín, 2009
I believe the bank offers adequate online methods (such as FAQs, help pages, an online community, and a customer support hotline) for addressing ATM faults and bank application problems.		
According to the bank's online processes, the problem has been resolved quickly.		
Despite the difficulty created by the ATM problem and bank applications etc, the bank's online response looked appropriate.		
The online methods demonstrate the bank's flexibility in resolving the ATM issue and bank applications.		

Research instrument	Cronbach's alpha	References
Interactional justice: <i>Reflective construct with 4 items</i>	0.750	Blodgett, Hill and Tax, 1997; Lin, Wang and Chang, 2011
Online contact (mails communications and virtual conversations, hotline) demonstrated the bank's commitment to resolving issues with the electronic services it provides to consumers.		
The online connection with the bank (virtual chat and email communication, hotline) was suitable for addressing the fault in the given electronic service.		
When I talked to the bank online about the problem, they were polite and treated me with respect.		
The bank detailed the reason and context of the faults and issues that occurred with the electronic service offered.		
Post-recovery satisfaction: <i>Reflective construct with 4 items</i>	0.738	del Río-Lanza, Vázquez-Casielles and Díaz-Martín, 2009; Lin, Wang and Chang, 2011
I am satisfied with the bank's responsiveness to the issue I faced with their online service.		
I believe that the bank's online options for managing issues with online service failure are excellent.		
I am satisfied with the internet response of this bank to my case.		
In my perspective, the bank's electronic service offered an acceptable resolution to my situation.		
Customers behavioral intentions: <i>Reflective construct with 4 items</i>	0.812	Mattila, 2001; Maxham and Netemeyer, 2002; Wong and Sohal, 2002
I'm likely to tell my friends and family that my overall experience with this online bank service was a good one.		
I will keep using these online banking services in the future.		
I think this bank is the best out of all the ones I could choose.		

Research instrument	Cronbach's alpha	References
I do not plant to deal with another bank in the future to get better online service.		

Source: authors' research results

As illustrated in Table 1, the survey's reliability was tested using composite reliability, which should be more than 0.70 (Wasko and Faraj, 2005). The rate is more than 0.70, indicating internally consistent, Cronbach's alpha is used to assess internal consistency. As the value exceeds 0.70, these findings back up the research's reliability. We observe that all elements have adequate Cronbach's alpha reliability coefficients and range from 0.713 to 0.812%.

4. RESEARCH FINDINGS

4.1. Sample profile

The demographic data represented the general composition and characteristics of the research participants. Most respondents were male (52.3%) and 47.7 females. Most responders were between ages of 21 and 30 (47.9 %), followed by those between 15 and 20 (23.1 %), 31 to 40 (18.5 %), and 10.5% older than 40. Regarding the degree of education, the majority (57.8 %) were undergraduate students and 42.2% postgraduate students. Most responders possess a high degree of education and every participant in this study was suitable for the research. Table 2 gives descriptive data on the respondent characteristics.

Table 2. Demographic statistics

Gender	Frequency	Percentage
male	170	52.3
female	155	47.7
Age		
15-20	75	23.1
21-30	156	47.9
31-40	60	18.5
more than 40	34	10.5
Education		
Undergraduate	188	57.8
Postgraduate	137	42.2

Source: authors' research results

4.2. Data analysis

This part shows the finding on verifying the validity of the hypotheses and statistical methods. A regression analysis using the stepwise approach is applied to test H1 regarding the impact of e-service recovery (procedural justice, distributive justice, interactional justice) on consumers' behavioral intentions. The hypothesis was tested using stepwise regression and compared the relative significance of e-service recovery dimensions to determine the dependent variable (customers' behavioral intentions) and the best-explained dimension for the variance in customers' behavioral intentions. Table 3 presents the findings of the hypothesis's multiple regression analysis.

Table 3. Multiple regression analysis for e-service recovery and customers' behavioral intentions

Model Summary				
Model	R	R ²	Adj R ²	Std. Error
1	.586 ^a	.343	.341	.45395
2	.627 ^b	.393	.389	.43698
3	.634 ^c	.402	.397	.43435
a. Predictors: (Constant), Interactional- justice				
b. Predictors: (Constant), Interactional- justice, Procedural justice				
c. Predictors: (Constant), Interactional- justice, Procedural justice, Distributive- justice				

ANOVA ^a						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34.728	1	34.728	168.526	.000 ^b
	Residual	66.560	323	.206		
	Total	101.287	324			
2	Regression	39.801	2	19.900	104.217	.000 ^c
	Residual	61.486	322	.191		
	Total	101.287	324			
3	Regression	40.727	3	13.576	71.957	.000 ^d
	Residual	60.561	321	.189		
	Total	101.287	324			

a. Dependent Variable: Customers behavioral intentions	
b. Predictors: (Constant), Interactional- justice	

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- c. Predictors: (Constant), Interactional- justice, Procedural- justice
d. Predictors: (Constant), Interactional- justice, Procedural- justice, Distributive justice

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	2.193	.148		14.791	.000
Interactional justice	.472	.036	.586	12.982	.000
2 (Constant)	1.878	.155		12.100	.000
Interactional justice	.319	.046	.396	6.958	.000
Procedural justice	.234	.045	.293	5.154	.000
3 (Constant)	1.764	.163		10.845	.000
Interactional justice	.284	.048	.352	5.876	.000
Procedural justice	.199	.048	.249	4.147	.000
Distributive justice	.102	.046	.125	2.215	.027

a. Dependent Variable: Customers behavioral intention

Excluded Variables^a

Model	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
					Tolerance
1 Distributive justice	.203 ^b	3.728	.000	.203	.662
Procedural justice	.293 ^b	5.154	.000	.276	.582
2 Distributive justice	.125 ^c	2.215	.027	.123	.588

a. Dependent Variable: Customers behavioral intentions

b. Predictors in the model: (Constant), Interactional- justice

c. Predictors in the model: (Constant), Interactional- justice, Procedural -justice

Source: results of the author's study

Table 3 displays multiple regression analysis (stepwise) findings used to test the impact of e-service recovery (interactional, distributive, procedural) on the consumer's behavioral intentions. As shown in model 2 the prediction model was statistically significant ($F = 104.217$, $p\text{-value} < 0.05$), with .393% of consumers' behavioral intentions variability ($R\text{ Square} = .393$) explained by the positive influence of two e-service recovery dimensions together (interactional, procedural). As a result, only two dimensions of e-service recovery effects customers' behavioral intentions and have a positive effect ($R = 0.627$). The distributive justice dimension has been removed from the regression equation according to the standardized Coefficients (Beta) equal to 0.125. As shown in Model 1, interactional justice is the most significant predictor of customer's behavioral intentions variance. The interactional justice remained the most influential on the dependent variable according to the standardized Coefficients (Beta) equal to 0.586. Where ($F=168.526$, $P\text{-value} < 0.01$) with ($R\text{ Square} = .343$) indicates that the interactional justice dimension explains 34.3% of the variance in customers' behavioral intentions. Moreover, ($R = 0.586$). As we expect indicates a positive correlation between interactional justice and customers' behavioral intentions. Therefore, H1 has been supported partially because distributive justice was excluded from the equation regression model.

The second hypothesis, H2, states that e-service recovery (distributive, procedural, interactional) positively affects customers' behavioral intentions. Multiple regression analysis was used to evaluate this hypothesis (Stepwise) to show the most explanatory and influential e-service recovery dimensions in the customer's behavioral intentions variation. Table 4 displays the analysis's results:

Table 4. Multiple regression analysis for e-service recovery and post-recovery satisfaction

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.678 ^a	.460	.458	.50299
2	.722 ^b	.521	.518	.47463
3	.731 ^c	.535	.530	.46846

a. Predictors: (Constant), Interactional- justice
 b. Predictors: (Constant), Interactional- justice, Procedural- justice
 c. Predictors: (Constant), Interactional- justice, Procedural- justice, Distributive- justice

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ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	69.616	1	69.616	275.158	.000 ^b
	Residual	81.720	323	.253		
	Total	151.336	324			
2	Regression	78.798	2	39.399	174.893	.000 ^c
	Residual	72.538	322	.225		
	Total	151.336	324			
3	Regression	80.891	3	26.964	122.868	.000 ^d
	Residual	70.445	321	.219		
	Total	151.336	324			
a. Dependent Variable: Post- recovery satisfaction						
b. Predictors: (Constant), Interactional- justice						
c. Predictors: (Constant), Interactional- justice, Procedural- justice						
d. Predictors: (Constant), Interactional -justice, Procedural- justice, Distributive justice						
Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.297	.164		7.897	.000
	Interactional justice	.669	.040	.678	16.588	.000
2	(Constant)	.874	.169		5.184	.000
	Interactional justice	.463	.050	.470	9.287	.000
	Procedural justice	.315	.049	.323	6.384	.000
3	(Constant)	.702	.175		4.003	.000
	Interactional justice	.410	.052	.416	7.861	.000
	Procedural justice	.262	.052	.268	5.064	.000
	Distributive justice	.153	.049	.153	3.089	.002
a. Dependent Variable: Post- recovery satisfaction						

Excluded Variables ^a						
Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Distributive justice	.238 ^b	4.889	.000	.263	.662
	Procedural justice	.323 ^b	6.384	.000	.335	.582
2	Distributive justice	.153 ^c	3.089	.002	.170	.588

a. Dependent Variable: Post-recovery satisfaction

b. Predictors in the model: (Constant), Interactional justice

c. Predictors in the model: (Constant), Interactional justice, Procedural justice

Source: results of the author's study

Table 4 presents the results of the multiple regression analysis (stepwise) performed to investigate the effect of e-service recovery (interactional, distributive, and procedural) on post-recovery satisfaction. Showing that in model 2, the prediction model was statistically significant ($F = 174.893$, $p\text{-value} < 0.05$), with .521% of post-recovery satisfaction variability ($R\text{ Square} = 0.521$) explained by the positive influence of two e-service recovery dimension together (interactional justice, procedural justice) standardized Coefficients (Beta) equal (.470, .323). As a result, only two dimensions of e-service recovery effects post-recovery satisfaction with a positive effect ($R = 0.722$). The distributive justice dimension has been removed from the regression equation according to the standardized Coefficients (Beta) equal to 0.153. The distributive justice dimension has been removed from the regression equation according to the standardized Coefficients (Beta) equal to (0.153).

According to Model 1, interactional fairness is the most important predictor of the variation in post-recovery satisfaction. The interactional justice remained the most influential on the dependent variable according to the standardized Coefficients (Beta) equal to 0.678. Where ($F=275.158$ $P\text{-value} < 0.01$) with ($R\text{ Square} = .460$) indicates that the interactional justice dimension explains 46.0% of the variance in post-recovery satisfaction. Moreover, ($R = 0.678$) indicates a positive correlation among interactional justice and post-recovery satisfaction. Therefore, H2 has been supported partially because distributive justice was excluded from the regression equation model. The third hypothesis, H3 asserts that post-recovery satisfaction influences consumers' behavioral intentions positively. This hypothesis was tested using simple regression analysis. Table 5 presents the results of the analysis.

Table 5. Simple regression analysis for post-recovery satisfaction and customers' behavioral intentions

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.647 ^a	.419	.417	.42685

a. Predictors: (Constant), Post- recovery satisfaction

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	42.436	1	42.436	232.908	.000 ^b
	Residual	58.851	323	.182		
	Total	101.287	324			

a. Dependent Variable: Customers behavioral intentions

b. Predictors: (Constant), Post- recovery satisfaction

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.980	.140		14.127	.000
	Post recovery satisfaction	.530	.035	.647	15.261	.000

a. Dependent Variable: Customers behavioral intentions

Source: results of the author's study

Table 5 provides a summary of the results of the simple regression analysis conducted to examine the effect of post-recovery customer satisfaction on their behavioral intentions, showed that the prediction model was statistically significant ($F = 232.908$, $p\text{-value} < 0.05$), with .419 % of consumers' behavioral intentions variability ($R \text{ Square} = 0.419$) explained by the positive effect of customers post-recovery satisfaction ($R = 0.647$; $T = 15.261$). The positive effect of post-recovery satisfaction on customers' behavioral intentions is expected. This indicates that H3 is supported. The fourth hypothesis, H4, states that post-recovery satisfaction mediates the relationship among e-service recovery and

customers' behavioral intentions. Using multiple regression analysis, this hypothesis was tested. Table 6 presents the results of the analysis:

Table 6. Findings of multiple regression analysis for the mediating effect of post-recovery satisfaction

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.634 ^a	.402	.397	.43435	.402	71.957	3	321	.000
2	.689 ^b	.475	.468	.40779	.073	44.190	1	320	.000
a. Predictors: (Constant), Interactional justice, Distributive justice, Procedural justice									
b. Predictors: (Constant), Interactional justice, Distributive justice, Procedural justice, post-recovery satisfaction									

ANOVA ^a						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	40.727	3	13.576	71.957	.000 ^b
	Residual	60.561	321	.189		
	Total	101.287	324			
2	Regression	48.075	4	12.019	72.276	.000 ^c
	Residual	53.212	320	.166		
	Total	101.287	324			

a. Dependent Variable: Customers' behavioral intentions									
b. Predictors: (Constant), Interactional justice, Distributive justice, Procedural justice									
c. Predictors: (Constant), Interactional justice, Distributive justice, Procedural justice, post-recovery satisfaction									

Coefficients ^a										
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error				Beta	Zero-order	Partial	Part	Tolerance
1 (Constant)	1.764	.163		10.845	.000					
Distributive justice	.102	.046	.125	2.215	.027	.475	.123	.096	.588	1.702
Procedural justice	.199	.048	.249	4.147	.000	.549	.226	.179	.517	1.934
Interactional justice	.284	.048	.352	5.876	.000	.586	.312	.254	.519	1.928
2 (Constant)	1.537	.156		9.824	.000					

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Distributive justice	.052	.044	.064	1.196	.233	.475	.067	.048	.571	1.752
Procedural justice	.114	.047	.143	2.443	.015	.549	.135	.099	.479	2.088
Interactional justice	.152	.050	.188	3.060	.002	.586	.169	.124	.435	2.299
Post-recovery satisfaction	.323	.049	.395	6.648	.000	.647	.348	.269	.465	2.148
a. Dependent Variable: Customers' behavioral intentions										

Source: results of the author's study

Table 6 shows the results of the multiple regression analysis conducted to test the hypothesis that post-recovery satisfaction mediates the relationship between e-service recovery and customer behavioral intentions. There is a positive effect of both interactional and procedural justice on behavioral intentions through the mediation of post-recovery satisfaction due to the significance of the model for both variables (p -value < 0.05; $t = 2.443, 3.060$). As shown in model 2, after interring the mediating variable in the regression equation, R^2 has changed from .402 to ($R^2 = .475$), also R has changed from .634 to ($R = .689$), and F changed (71.957 to 44.190) as shown in the Coefficients table that is the distributive justice is nonsignificant, and that means the post-recovery satisfaction removed the distributive justice from the regression equation (Beta = .064, sig .233) that is considered completely mediation.

5. DISCUSSION

Online service providers, such as banks often experience e-service failure. To develop effective recovery strategies, service managers must understand how to recover from failed online services. There is still a lack of knowledge regarding how companies may offer online service recovery and how this affects customer views and post-recovery behavior. As a result of that research gap, this study investigated how procedural, distributive, and interactive online recovery tools improve recovery satisfaction and behavioral intentions. Customers' views of fairness concerning the aforesaid e-service recovery and the subsequent influence on recovery satisfaction and behavioral intentions were examined in the research. According to the conclusions of the research, customer requirements for redress may be met via online tools on the bank's website.

In the current study, we have proposed four hypotheses to clarify the influence relationships between the study variables (e-service recovery, satisfaction after recovery, and consumer behavioural intents). All research hypotheses have been supported by the analysis. The first hypothesis, H1, was partially supported, testing the effect of e-service recovery (procedural, distributive, interactional) on consumers behavioural intentions. We concluded that interactional and procedural justice significantly and positively influence customers' behavioural intentions. There was no impact of distributive justice on

behavioural intentions as it was excluded from the regression equation. Interactional justice had the most considerable effect and the most significant indicator for explaining the customer's behavioural intentions variance.

These results are consistent with earlier studies (Chebat and Slusarczyk, 2005; Harun *et al.*, 2019). These results differ from the results of some prior studies (Blodgett, Hill and Tax, 1997; Gohary, Hamzelu and Pourazizi, 2016). These results can be explained by the customers' realization that the bank interacts with them with respect and appreciation through electronic communications, text messages, emails, and the accompanying courtesy and respect, providing an apology for the service failure and an explanation for the causes of the failure. All is positively reflected in the customer's intention to repeat the transaction, or the positive WOM, so they do not switch to another bank.

H2 has been supported partially. The findings concluded that only two dimensions (interactional and procedural) positively impacted post-recovery satisfaction, and distributive justice does not affect recovery satisfaction. Besides that, interactional justice had the most considerable effect and the most important factor for explaining the variance in post-recovery satisfaction. According to earlier research on offline service context, perceived fairness toward offline service recovery may be a predictor of user recovery satisfaction, as shown by the findings presented by (Tax, Brown and Chandrashekar, 1998; Smith, Bolton and Wagner, 1999; Ahmad, 2002; Maxham and Netemeyer, 2002; Singh and Crisafulli, 2016; Migacz, Zou and Petrick, 2018; Chao and Cheng, 2019). Customers develop a sense of procedural fairness when service failures can be resolved quickly via FAQs, E-support pages, and discussion boards.

Consumers exhibit interactional justice when technology-mediated connections reflect courtesy, sympathy, and care for a service failure. In turn, perceived fairness communicated by e-service recovery solutions restores consumer satisfaction. This study extends prior research by demonstrating that service recovery may be achieved utilizing online resources, such as online data and technology-mediated interactions. Furthermore, if appropriately constructed, these instruments are viewed as fair. Customer satisfaction with e-failure recovery interactions is dependent on the perception of fairness (justice) in relation to online service recovery. These statistics demonstrate the relevance of the justice concept to comprehending customer responses to e-service failures followed by e-recovery.

These findings vary from those of several earlier studies (Smith, Bolton and Wagner, 1999; Kuo and Wu, 2012; Nikbin *et al.*, 2012; Nikbin *et al.*, 2015), which found a positive effect of distributive fairness on post-recovery contentment. However, interactional fairness has no effect on recovery satisfaction. This difference may be due to the cultural environment. The cultural background significantly affects the customers' awareness of the fairness efforts

followed by the bank to service recovery. It also contributes to shaping its attitudes and behaviour toward the service provider.

Interestingly, interactional justice delivered by technologically facilitated communications is an even stronger predictor of e-recovery satisfaction than procedural fairness given by e-recovery processes. The research finding agrees with Ahmad (2002) argument that Customers are satisfied with service recovery when they get individualized communications and a sense of connection to staff. Consumers seem to favour personalized human treatment even when encounters are mediated by technology. The above conclusion is in line with the results of past studies on the recovery of offline services, which show that empathy, civility, and concern about the problem shown by frontline staff during face-to-face interactions are important for rebuilding consumer trust in the company (Kim, Kim and Kim, 2009).

Moreover, H3 has been supported, concluding that post-recovery satisfaction positively influences customers' behavioural intentions. These findings agree with the findings of prior studies (Huang, 2011; Kuo and Wu, 2012; Nikbin *et al.*, 2015; Tsao, 2018). This result is logical and consistent with the planned behaviour theory and the theory of action control. These two theories link attitudes and trends on one side and behaviour on the other, meaning that behaviour must be preceded by attitudes or trends, whether negative or positive, when the levels of customer satisfaction with the bank rise because of to effectively service recovery, their intentions to adopt positive behaviours towards it rise.

In addition, Hypothesis 4 was supported, and we found that post-recovery customer satisfaction mediates the relationship between e-service recovery and consumer behavioural intentions. This outcome is consistent with the social exchange theory, which indicates that the company presents a specific activity or action to customers in any exchange process. In return, it obtains another activity from the customer in a specific behavioural reaction or response. This response may not be achieved unless the customer is satisfied with the firms' performance. In the setting of e-service recovery, a failure in the service leads to a state of imbalance in the exchange process. Still, a high response on the company's part to recover from this failure leads to the customer's awareness of the exchange process fairness, which reflects positively on consumers' satisfaction and future behaviour towards the service provider.

The conclusions of this research have several ramifications for electronic banking service providers concerned with keeping satisfied consumers. Although e-service failure temporarily destabilizes client connections, addressing the issue may assure long-term customer relationships. The emergence of interactional justice as a crucial component in generating post-recovery satisfaction and behavioural intents reveals rising customer perception patterns in e-service delivery processes. For e-services recovery, managers must

emphasize supplying high-quality data to their employees. Service bank workers should be trained to investigate and comprehend the customer's experience with a service problem. The consumer should be informed of the recovery procedure and the timeframe for banks' systems to recover it. E-recovery must be backed up by various communication methods, including SMS, FAQ, and email.

6. IMPLICATIONS AND RECOMMENDATIONS

First, previous studies have studied how companies might provide recovery of offline services and the resulting sense of fairness by customers. On the other hand, there have been omissions about situations in which e-services fail and e-recovery. A growing amount of research focuses on e-service failures and recovery (Holloway, Wang and Parish, 2005; Harris *et al.*, 2006; Lin, Wang and Chang, 2011). Yet, few studies examining how growing businesses may fix e-service failures using e-recovery methods. Little consideration has been given to consumers' online responses to service failures and recoveries. The current study improves e-failure recovery management research by showing that consumers see FAQ sites, assistant pages, and discussion forms as fair processes for resolving e-service failures if these tools result in rapid issue resolution. In addition, there is evidence that technology-mediated communications are a thriving e-recovery technique for satisfying customers' self-esteem requirements.

Second, earlier research on failure recovery acknowledges the usefulness of the fairness concept in describing offline service recovery attempts (Tax, Brown and Chandrashekar, 1998; Chebat and Slusarczyk, 2005; Del Río-Lanza, Vázquez-Casielles and Díaz-Martín, 2009). This research demonstrates the effectiveness of the justice framework for comprehending consumer reactions to e-service failures followed by e-service recovery. It has been demonstrated that the feeling of justice towards e-service recovery promotes consumer satisfaction and, in turn, brand loyalty and behavioral intentions. Interactional justice conveyed via technology-mediated relationships influences e-recovery satisfaction more than procedural justice conveyed through online recovery procedures. From a theoretical approach, the above data show that fairness judgments about online recovery are critical for understanding consumer retention. Therefore, investigations in this field should evaluate the significance of fairness perceptions while analyzing consumer attitudes and behavioral intentions with e-service recovery.

In practical terms, this research may provide banks with insight into the major aspects that might boost customer satisfaction after a bad service experience. It is also crucial to highlight that this study provides banks with a means to limit the effect of the disservice rendered, preserve their client portfolio with as little defection as possible, and protect their market reputation. In addition, this study shows the critical sectors of banks and the results of consumers who complained about service failures, assisting these sectors in

developing retention strategies for these customers. The study contributes to offline research on the significance and relevance of a company's recovery culture and workers' attitudes about e-service recovery.

Also, the fact that interactional justice significantly affects post-recovery satisfaction shows how important it is for bank managers to put resources into carefully designing how customers and employees interact with technology. When it comes to e-service recovery, customers will be happy if they get personalized, rather than standard, emails that express courtesy and compassion, and customer care representatives are trained to provide interactional justice through live chat.

Banks may accomplish e-service recovery by establishing a good e-service orientation policy at the bank level, implementing specific rules to assure rapid and successful e-service recovery, and conveying the consumers' actual demands. Every level of the bank's hierarchy should accord the service recovery procedure the highest significance. Delegation of authority in e-service recovery should be done, and requests for approvals from higher-ups should be avoided to provide consumers with a feeling of rapid resolution. E-service recovery personnel need sufficient latitude to tailor the service recovery experience and successfully resolve consumer complaints. All personnel must get thorough training to address customer complaints resulting from e-service failures quickly. Service staff should be adequately trained when new technology interfaces are implemented. The e-recovery procedure is more satisfactory to digitally minded consumers. Thus, banks should guarantee that training sessions are organized to accustom clients to e-service and use. Co-creation of digital services may be achieved by including clients in the process. Banks can educate clients about their electronic service efforts.

7. CONCLUSIONS AND LIMITATIONS OF THE STUDY

Our results are significant for the banking industry in Romania, to increase interest in the electronic services provided to its customers. The research showed that procedural and interactional justice strongly influenced post-recovery satisfaction and behavioral intentions. Moreover, post-recovery satisfaction mediates the link among e-service recovery and customers' behavioral intentions. Besides, the researchers concluded that interactional fairness is a significant finding among the other service recovery dimensions. Therefore, contact with dissatisfied consumers should be prompt and effective. Bank service representatives should take the time to comprehend the client's concerns and reply promptly to consumer complaints. It would be wonderful if the bank had a standard response module for regular e-failures, which could be tailored to the customer's situation. The consumers' experience during e-recovery interactions, such as prompt and efficient recovery action and justice in the transformation, will go a long way toward keeping customers. Banks must

guarantee that their personnel is customer-focused and that their systems provide automated and prompt redressal methods. Customers must get appropriate information before and after the recovery stages to instill a sense of fairness for future procedures.

The e-service recovery model designed for e-banking services may promote input service recovery quality and improve decision-making on customer expectations. In addition, the research confirms that consumers are unwilling to transfer service providers but are inclined to form positive behavioral intentions if they perceive excellent online service recovery. The reciprocity norm and early evidence in offline service breakdown and recovery interactions are consistent with this finding. Customers anticipate the bank to administer justice through e-service recovery. They desire to retain their connection with the bank and develop good behavioral intentions. In summation, we may infer that if a bank treats clients who have experienced service failures adequately, the consumers tend to be happier and, as a result, create a good behavioral intent, and vice versa.

The study's primary limitation is that it only examines e-service recovery strategies in the banking sector. The results are limited to this specific situation and the conclusions are only applicable in this environment. Also, the model lacks the severity of the failure as a separate component. Previous studies have shown that the severity of a breakdown may influence the customer's perception of service recovery, so future studies may add and test this concept inside our model. While our research puts all e-service failures together, future research may isolate the various e-service failures caused by various channels, such as mobile banking, Internet banking, and ATMs, and investigate them separately.

The study is limited to e-services in the banking business, so it cannot be extrapolated to other industries. Future studies may test this concept in e-insurance services, e-retailing service providers, and e-hotel/e-airline reservations that confront similar challenges.

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A BIBLIOMETRIC ANALYSIS OF THE SCIENTIFIC LITERATURE ON SUSTAINABLE FINANCE: EUROPE' S CONTRIBUTION

CONSTANTIN-MARIUS APOSTOAI

Alexandru Ioan Cuza University of Iași

Iași, Romania

marius.apostoaie@uaic.ro

IRINA BILAN

Alexandru Ioan Cuza University of Iași

Iași, Romania

irina.bilan@uaic.ro

STANIMIR KABAIVANOV

Plovdiv University "Paisii Hilendarski"

Plovdiv, Bulgaria

stanimir.kabaivanov@uni-plovdiv.bg

Abstract

Up until recently, the world got used to the idea that the most ardent issues to be solved are related to poverty, climate change, economic inequalities and pandemic threats. Yet again, the world faces new social, environmental, and economic challenges imposed by the conflict in Ukraine. Managing all these societal issues requires the use of the most important drivers of all economies, financial capital. The overall financial system needs to adapt by embracing sustainability principles and practices, and integrate them within all its processes. As the paper reveals, the topics related to 'sustainable finance' continue to grow in number and importance, clearly becoming an ardent subject in the agenda of numerous governments, regulators, private entities and, last but not least, financial institutions. The aim of this paper is to provide an overview on the scientific literature that conceptually and/or empirically addresses topics related to sustainable finance (highlighting, in the process, Europe's contribution). Using a bibliometric approach and a dataset of 1915 research materials extracted from Scopus (covering 1991-2021), we identify key emerging research trends in sustainable finance and provide a platform for academics upon which they may build their own research on the topic.

Keywords: *sustainable finance; sustainable development; bibliometric analysis; Scopus; VOSviewer.*

JEL Classification: G00, Q01, Q56

1. INTRODUCTION

The concern over the impact of economic activities on nature and social structures has been discussed for decades (Migliorelli and Dessertine, 2019; Migliorelli, 2021). In more recent times, in 2018, William D. Nordhaus and Paul M. Romer received the Nobel Prize in Economic Sciences for integrating *innovation* and *climate* with *economic growth*. Afterwards, in 2019, the prize was awarded to Abhijit Banerjee, Esther Duflo and Michael Kremer for ‘their experimental approach to alleviating global poverty’ (a major issue with countless social ramifications). These significant awards clearly highlight the importance of the *environmental* and *social dimensions*, and their connections with *economic growth*, putting light, in the process, on the three fundamental pillars of *sustainability*.

It is very important that when designing and implementing effective policies that target economic development, policy makers should not disregard the effects upon the environment or the society. To achieve prosperity in a society through a more sustainable, equitable and robust economic growth, policy makers, in particular, should not neglect the role of the most important drivers of all economies, *financial capital*. In fact, following Scholtens (2006, p. 19) “*finance is grease to the economy. As such, it can also affect the sustainability and social responsibility of the firm*”. Thus, Scholtens (2006) emphasizes finance as a driver of sustainability, especially through socially responsible investments (Waring and Edwards, 2008). With regard to the literature on the relationship between finance and sustainability, authors such as Ferreira *et al.* (2016) or Aspinall *et al.* (2018) do a very good job in highlighting the extent of it.

The financial system (as the main provider of financial capital) needs to continuously adapt by embracing sustainability practices and principles and integrate them in all its internal processes. In fact, all the active players in a given economy (*financial institutions* included) need to consider the environmental, social and governance criteria when channeling their finances towards investments opportunities.

In a broader context, when we account for the development and implementation of common European policies, proper understanding of sustainable finance is of crucial importance due to the following reasons:

1) Traditional tools for conveying a financial and monetary policy may have limited efficiency in the long-term.

As we have recently witnessed, the adoption of a negative interest rate policy can be used to support economic activity. Due to the multiple transmission channels, it is also getting more and more challenging to use traditional tools like deposit facility rates to support long-term policies. After all, when short-term rates have been kept for a long time close to zero and entering negative territory from time to time, it is clear that the power of rate cutting approach for solving future challenges is already limited.

2) Turning legal obligations, such as the proposed European Climate Law, into a lasting change in the way EU member states develop their economies requires adopting different approaches and stimuli.

Just like approaches that are vulnerable to effects like “piling up debt” are not completely suitable for closing up the so called “green financing gap”, it should also be noted that there is hardly a “one-size-fits-all” policy for all member states. Yet, by setting up a common deadline and defining a common objective, it is necessary to consider that only certain macroprudential tools will align well with achieving climate goals (see Biloskurskyy, Verstiak and Vinnychuk, 2019).

3) Differences across EU member states are still significant, and this effect is even more important when we take into consideration discrepancies between economic development of separate regions within least developed countries.

Therefore, we believe that the economic impact of initiatives like European Green Deal will be felt in a very different way across separate regions. In order to support, instead of prohibit the development of regions, policy makers need to be aware of recent developments in the field of sustainable finance. This is of particular importance for regions that depend on few industries that are most severely impacted by the restructuring and that would need additional financing and alternatives for keeping jobs and preserving the standard of living. And this must be done in a context where, with every enlargement of the EU, heterogeneity is increasing. As a consequence, this will be reflected, among other things, in “the difficulty of managing economic affairs, the decision-making process and the consequences affecting not only EU policies but also individual members, which is reflected in the overall EU governance” (see Vrnakova, 2018).

The growing number of researches and events that currently look into the quality of the environment clearly stresses the significance of the topic at all levels of the society (including the financial dimension). This is even more important when we notice that most of the events are taking place in Europe. Climate change and sustainability have drawn much attention internationally. In light of all the currently events that unfold, the topics related to ‘*sustainable finance*’ continue to grow in number and importance, clearly becoming an ardent subject in the agenda of numerous governments, regulators, private entities, international organizations, and, last but not least, financial institutions. The EU, an incumbent global ecological leader (as also highlighted by Todorovic, 2018), should also regard finance as merely an instrument in the process of designing the policy framework to achieve sustainable outcomes. Such a framework will redefine business as usual, moving from an ‘exploiting nature’ oriented economy towards a ‘restoring nature’ oriented one.

The aim of this paper is to provide an overview on the scientific literature to date that conceptually and/or empirically addresses the topic of *sustainable finance*. In regards to what has already been done in the field, we aim to identify

key emerging research trends in sustainable finance and provide a fresh perspective and also a working platform for researchers and practitioners upon which they could start building their own research in the field. In addition, we carefully look at Europe's contribution in the field of science, with regard to the topic at hand.

2. THEORETICAL MILESTONES

A broad survey of the scientific literature on the topic of *Sustainable Finance (SF)* reveals a wide panel of definitions and interpretations. The term 'sustainability' by itself is difficult to grasp, involving a wide spectrum of concepts related to the mitigation of economic, social and environmental issues; according to Niñerola, Sánchez-Rebull and Hernández-Lara (2019) it involves "a wide spectrum of concepts, related to reconciling economic, social, and environmental issues, such as the bio, green economy, or circular economies". Having difficulties in pinning the concept makes it harder for practitioners and policy makers to implement it into practice. In this section, a brief literature review on SF is provided where the most important definitions and interpretations are brought forward and analysed.

An overview of the existing definitions is provided by Haigh (2012) who states that "defining sustainable and responsible finance and investment" is somehow tricky, and that this is partially related to the fact that it is also difficult to define its opposite, i.e. "what unsustainable or irresponsible financing and investing activity might mean". Migliorelli (2021, p. 1) also mentions that "defining exhaustively sustainable finance, that is ensuring clarity on both its definition and implementing standards, is not an easy task". We conclude that, an 'off-the-shelf' and universally accepted definition of sustainable finance does not exist (yet).

In their work, Jaeggi *et al.* (2018) propose a broader and more precise understanding of the term SF in the form of a "collective concept that encompasses sustainable finance strategies" (Jaeggi *et al.*, 2018, p. 59). Such strategies are designed to mitigate the risks and benefit from the opportunities that derive from the interplay between sustainability challenges and finance. Following the authors, SF is "about financial institutions addressing the risks and opportunities related to sustainability challenges such as climate change, water scarcity, and other systemic problems" (Jaeggi *et al.*, 2018, p. 60), surpassing sustainable investing. The later concept (sustainable investment) is often brought forward in discussions on SF, both by practitioners and academics. Busch, Bauer and Orlitzky (2016) regard this concept as a term for investments that try to contribute to sustainable development by integrating in their investment decisions the long-term environment, social and governance criteria.

According to Amaeshi *et al.* (2007), *sustainable finance* emerged at the core of the corporate social responsibility movement and, in time, was

encountered under various terms such as ‘socially responsible investments’, ‘green banking’ (see also Apostoaie, 2018) and ‘responsible lending’ (see also Baker and Nofsinger, 2012).

Ferreira *et al.* (2016) present a systematic review of literature about finance and sustainability in accordance to the thematic fields as follows: investors in general; SRI; governance over impact investment; institutional investors; climate change and human rights; non-renewable extractive industry; and sustainable development.

Gerster (2011) points out that SF is defined as a kind of financing addressing environmental, social, and governance (ESG) impacts of financial services. Schoenmaker (2017) proposes a framework for SF based on Sustainable Finance Models (SFM), where he distinguishes between SF 1.0 (Profit maximisation, while avoiding “sin” stocks), SF 2.0 (Internalisation of externalities to avoid risk) and SF 3.0 (Contributing to sustainable development, while observing financial viability).

Sandberg (2018) adopts a normative rather than a descriptive way of describing SF, in the sense that the author is not concerned with how the financial system currently works, but rather with how it ought to work in the future. He first outlines the strengths and weaknesses of the dominant theory of finance rooted in neoclassical economics and laissez-faire politics. Then he proposes a ‘two-level model of sustainable finance’. The central idea of his view on SF is that financial actors should have leeway to pursue their profit or efficiency goals but must monitor and act on considerable clashes with the common goals of society. In such cases, public policy should support self-regulation by the market, except in cases of severely misaligned incentives. In light of common policies, like there are in the European Union, this view is actually quite close to the idea of having a common goal, or a framework or rules, and then leave certain freedom of individual member states to impose additional restrictions or give longer transition periods. In such case, the most important question remaining is where to draw the border and what rights should be delegated. As discussions about COVID-19 recovery fund have demonstrated, achieving a consensus is neither easy, nor fast.

There are also some authors that refer to ‘risks’ when describing SF. Clarke and Boersma (2016) remind us that the risk taking behavior was one of the catalysts of the most recent global financial crisis and that risks can take many forms. Beck (1992) defines the risk as a “systematic way of dealing with hazards and insecurities induced and introduced by modernization itself”. In this regard, in our modern society, risks are not only of financial nature, but may originate also outside the economic system. Following Boersma, Lynch and Schofield (2014), civil society groups have argued for risk to be increasingly defined in a social and environmental sense, in addition to financial risk. On a similar note, the Bank of England Governor mentioned in a 2015 speech that: “Our societies face a series of profound environmental and social challenges. The combination of the weight of

scientific evidence and the dynamics of the financial system suggest that, in the fullness of time, climate change will threaten financial resilience and longer-term prosperity. While there is still time to act, the window of opportunity is finite and shrinking.” (Carney, 2015). As such, it is in the interest of financial institutions to understand and manage the afore-mentioned risks, in both their own as well as in their clients’ investment portfolios, to help upkeep their future revenue growth and preserve a global system that provides a stable basis for that long-term economic growth (Jaeggi *et al.*, 2018). One important goal of this paper is to highlight how well risk-based approach can fit in contemporary market conditions due to the fact that it is not always clear who bears the long-term environment risks. If environment risks are not properly assessed, this would lead to mispricing assets and potential overinvestment in sectors that cause excessive pollution (this holds even if the sector is not one of the top polluters in absolute terms). Analysis of bibliometric data in this paper can help determine if enough attention is paid to analyzing of risks and their attribution. In contrast to research dedicated to specific instruments or environment issues, this approach can provide a broader view of the study interests and help identify areas attracting less attention.

If we were to look in the Web of Science database, the most cited work that deals with SF belongs to Soppe (2004). The author applies the definition of *sustainable growth* provided in the Brundtland Report, to *finance*, as a discipline; following the World Commission on Environment and Development, “sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (1987). Then, he exemplifies the new sustainable finance concept by applying four criteria, and benchmarks these to a traditional and behavioral approach of finance. He concludes with describing SF as “a financial policy that strives for triple-bottom-line performance measurement with human actors that opt for maximizing multi-dimensional preference functions” (Soppe, 2004, p. 221). Urban and Wójcik (2019) also define SF in the spirit of the Brundtland Report, that is finance which protects the fundamental right of “all human beings” to “an environment adequate for their health and well-being” and safeguards inter-generational equity.

We also looked into an institutional approach, specifically in the United Nations Environment Programme (UNEP) Inquiry into the Design of a Sustainable Financial System. Here we found that “Sustainable development requires changes in the deployment and relative value of financial assets and their relationship to the creation, stewardship and productivity of real wealth. A *sustainable financial system* is therefore one that creates, values and transacts financial assets in ways that shape real wealth to serve the long-term needs of an inclusive, environmentally sustainable economy.” (UNEP, 2015, p. 13)

Following Carè, Trotta and Rizzello (2018), there are also other concepts that could be studied when investigating SF, namely: climate finance (Richardson, 2014), green finance (Weber, 2015; Ryszawska, 2016), carbon

finance (Schaefer, 2012; Ryszawska, 2016), environmental finance or environmentally sustainable finance (Richardson, 2005). Carè, Trotta and Rizzello (2018) strongly believe that in studies on these topics during past years, the focus was on the impact that finance may have in terms of sustainable development (identifying a major trend in terms of environmental sustainability of financial practices and products).

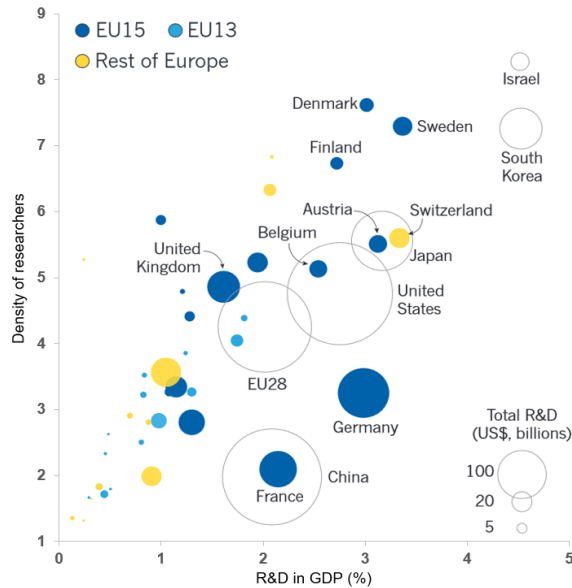
Jaeggi *et al.* (2018) highlights that the term SF grew significantly in importance in the last two decades, to an extent that now it represents the leitmotiv of thousands of initiatives and studies brought by:

- *worldwide organizations* such as: United Nations Environment Programme, World Bank Group, Financial Stability Board, University of Cambridge;
- *various academic journals* address sustainable finance topics, among which: Journal of Sustainable Finance and Investment, Journal of Environmental Investing, Journal of Cleaner Production, Handbook of Environmental and Sustainable Finance, etc.;
- *private companies* and *NGOs*: The Boston Consulting Group, KPMG, McKinsey, World Wide Fund for Nature.

Before we take a closer look at the scientific output generated in Europe with regard to the topic at hand, we propose a further reading of Van Noorden and Butler (2019), who highlighted, in a recent study, Europe's contribution in the field of science in general. The authors emphasized in their work the diversity of scientific activity production across European countries: "...from the research-intensive Nordic region, through the science powerhouses of Germany, the United Kingdom and France, to former communist states trying to strengthen their research bases and countries that extend into Asia" (Van Noorden and Butler, 2019, p. 470). At the end, we have a partnership of 27 member states with around 450 million people, which has at its core science and innovation as drivers for societal and economic development. Science and innovation are themselves powered by large funds, pan-European research programmes which are wider than the EU itself and support collaborative research and mobility across the bloc. For example, just in 2017, the EU member states spent around €320 billion on R&D (public spending reaching around 40% of this amount). Figure 1 provides, in this regard, a clear image of the R&D as percentage of gross domestic product in relation to the density of researchers (per 1,000 population) with a special emphasis on EU15 and EU13. As such, the world leaders in terms of the share of their economies devoted to research, behind Israel and South Korea, are Sweden, Austria, Denmark and Switzerland (while the EU13 countries are investing smaller shares in R&D). These important financial allocations for R&D by the European countries in 2017 are not casual as they are the results of a continuous spending on research and development

over the last two decades (with an average of around 5% per year in real terms since 2000) – see Figure 2.

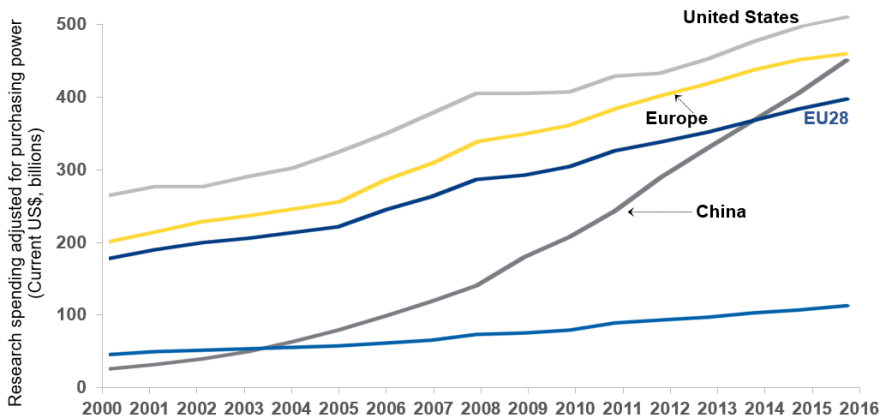
Figure 1. The research economy



Source: after Van Noorden and Butler (2019, p. 471)

Nonetheless, as seen in Figure 2, China is quickly overtaking European countries, as this Asian country spends around two-thirds of what the EU does on R&D, in absolute terms. In relation to the global R&D spending, Europe's share has shrunk from around 28% in 2000 to 23% in the beginning of 2017.

Figure 2. Science spending in the World



Source: after Van Noorden and Butler (2019, p. 471)

In conclusion, while the context in which scientific research outputs on the topic of *sustainable finance* could have been produced existed (as we have seen earlier in terms of R&D spending in European countries) and the importance of the topic is an increasing one over the last years, let's take notice, in what follows, the results of our research and pinpoint Europe's contribution.

3. METHODOLOGY

To provide an overview of the scientific production related to Sustainable Finance (SF), we developed a bibliometric analysis. Having very close links to the accepted, and analogous 'biometrics', 'econometrics', and 'scientometrics', the term was first introduced by Pritchard (1969) in a study where he applied mathematical and statistical methods to books and other media of communication. Essentially, *bibliometrics* is the application of quantitative analysis and statistics to publications such as journal articles and their accompanying citation counts.

To achieve the aim of the research, the paper uses one of the most important bibliographic databases, *Scopus*, which belongs to Elsevier (2019), and has over 70 million multidisciplinary records. We followed a methodological procedure similar to Niñerola, Sánchez-Rebull and Hernández-Lara (2019). In their work, the authors reviewed the relevant literature on 'sustainable tourism'. In order to carry out our research, we used several keywords related to *sustainable finance* that originate in the literature provided above (*sustainable* OR *sustainability* WITH *financ** OR *financing*) and looked for their occurrence in the title and keywords. We focused only on titles and keywords in order to retrieve the most relevant literature related to sustainable finance. There are two important arguments for limiting the inputs in such a way:

1) Use of well-known and reputable databases makes it easier to assess sources that are likely to be really influencing the decision-making process.

While there are reputable peer-reviewed journals that are not indexed in these databases, documents within Scopus are more likely to get wider attention and be noticed by decision making bodies and general public.

2) Strict rules that are imposed to maintain journal indexing is also helping to get comparable and consistent inputs across different time periods.

As we cover a considerable amount of time, this is an important prerequisite to draw conclusions on the data inputs.

The sample was initially composed of 4589 document results up to august 2022. We then filtered the data by eliminating subject areas such as: medicine, nursing, mathematics, arts and humanities, neuroscience and others, as these do not cover the scope of our paper. The search retrieved 2563 results. We then proceeded in eliminating document types that could present the risk of not being considered "certified knowledge", or publications that have been critically reviewed. Ramos-Rodríguez and Ruíz-Navarro (2004) include here books,

doctoral theses, and scientific congress records and, by extension, we also considered book chapters, letters, notes, conference reviews and reports. In addition, retracted, erratum, in press and undefined documents were also disregarded. That gave us a total of 2312 documents. After excluding the documents written in other languages than English, we remained with 2228 results (the other documents were mainly in Russian, 28 papers, Spanish with 18 documents, French with 16 documents, and German with 8). Since the analysis was performed by mid of 2022, we eliminated entries from this year (given that we had data for half of year), resulting in 1915 documents.

Out of the 1915 documents, 1360 of them are articles, 354 are conference papers, 163 are reviews, 23 are short surveys, and 15 are editorials. Moreover, if we were to narrow our research by focusing on those documents that have ‘sustainable finance’ in the title, the enquiry would retrieve 60 findings (the oldest one dating back in 1992). In addition, only 135 documents have explicitly SF as a keyword (the first paper dating in 2011). There are 67856 individual references mentioned in the sample of 1915 documents. There are 20348 individual research works (since 1993 and up to 2021) that cite the 1915 documents.

The bibliometric data of each document was exported into an Excel file which was subsequently processed using VOSviewer. This is a freely available computer program developed by van Eck and Waltman (2010) for constructing and viewing bibliometric maps. This program in particular pays special attention to the graphical representation of bibliometric maps. Analysis of the bibliometric data can be of help for both decision-making bodies, as well as the general public in the following ways:

1) Identify models for assessment of sustainable finance instruments and policies.

Due to the complexity of sustainability and climate changes it would be better to use all accumulated knowledge and experiments before making decisions or introducing new policies. Research papers and areas highlighted by the bibliographic study can focus the attention in the right direction.

2) Identify research centers that are dedicated to studying the sustainable finance and use their expertise in probing new policies and estimating their impact.

As discussed in Lannoo and Thomadakis (2020), the EU may not be on track to meet its goals set for 2030. It is, therefore, essential to make use of knowledge and expertise available in already formed research groups and centers.

3) Use research results in estimating the effects of existing and past decisions in order to better plan new actions.

Financial crises often tend to raise the importance of short-term investment, thus shortening the horizon of market participants. Being able to assess long-

term effects can help in introducing new instruments and policies that counter these effects when it comes to achieving sustainability goals.

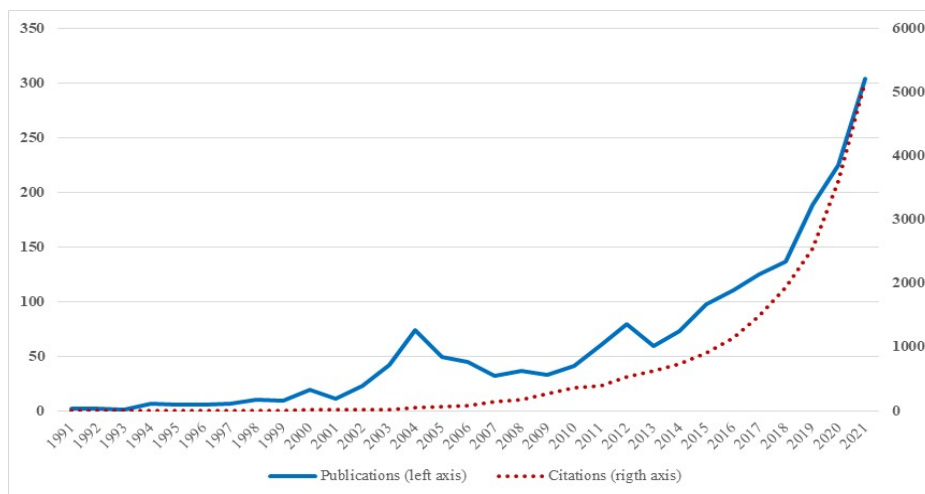
4) Use comparative studies to highlight special needs and individual requirements for member states or separate regions.

If we group research topics by country, we can identify problems of local significance and use this knowledge to better plan EU-wide actions.

4. RESULTS AND DISCUSSIONS

Although there is evidence that in practice some traces of *sustainable finance* date back to at least the 16th century (Milano, 2011), the first academic output that briefly sends the reader's thoughts towards SF was produced in 1991 (see Figure 3). In that paper, the author aims to explain “the essential logic of adjustment lending by the World Bank, and to assess some of the implications of the Bank's expertise in this genre for the practice of project lending” (Qureshi, 1991). It is in this process of lending where the binding contracts must include also some form of responsibility towards sustainability. It should be noted that late 1990's is also the period that witnessed the rise of derivative instruments associated with sustainability, and weather risks in particular. These topics are not separately studied in the input data set, as the research interest there is rather specific and would require to separate purely technical papers from those covering policies and long-term effects.

Figure 3. Publication and citation trends (no. of documents)



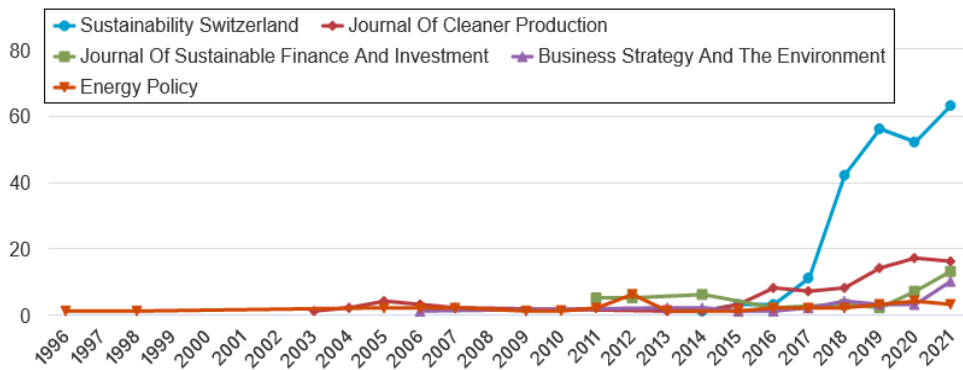
Source: own representation

As one can notice in Figure 3, since the first publication that dealt in some form with the topic at hand, the literature has grown rapidly. An exponentially increase can be observed in particular since the 2000's. Even with attention

drawn to dramatic events like the crisis of 2008 (which is indicated by the decrease in the number of publications in the same year) the interest in sustainable finance remains very high.

In addition, one important boost in academic productivity was noticed following the landmark international agreements on the United Nations (UN) 2030 Agenda adopting the Sustainable Development Goals (SDG) and the Paris Agreement on climate action (United Nations, 2015). Migliorelli and Dessertine (2019) highlight that, in both these initiatives, the sustainability governance schemes and accountability patterns have put on finance an unprecedented attention, and its role has been recalled as a key enabling factor for the attainment of the most ambitious sustainability-related objectives.

Figure 4. Top five publication sources (no. of documents)

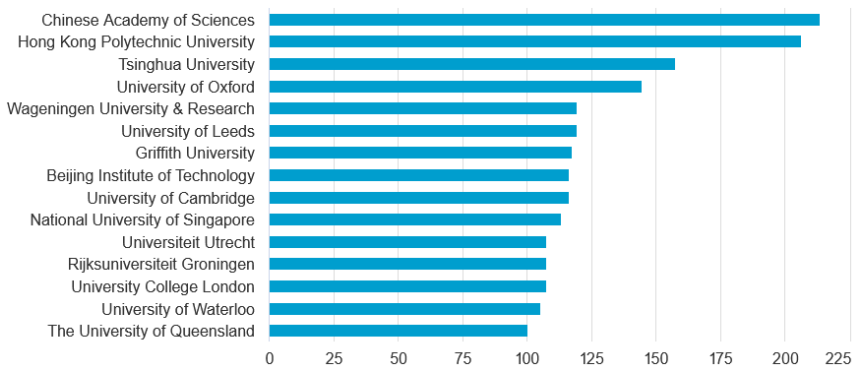


Source: own representation

Figure 4 depicts the top five publishers of SF related literature. There are 9 journals with three to five published papers and 36 journals with more than 6 published articles. Although the *Sustainability* Journal captures the viewer's attention by reporting 63 documents related to SF in 2021, its first publication on the topic was recorded only seven years ago, in 2014. The journal that publishes almost constantly at least two papers per year since one and a half decade ago, is *Energy Policy*, the first paper being in 1996. The main takeaway from here is that SF is an interesting topic not only for authors to look into, but also for journals to publish works in the area.

Figure 5. The most encountered affiliations of published and citing works (no. of documents)

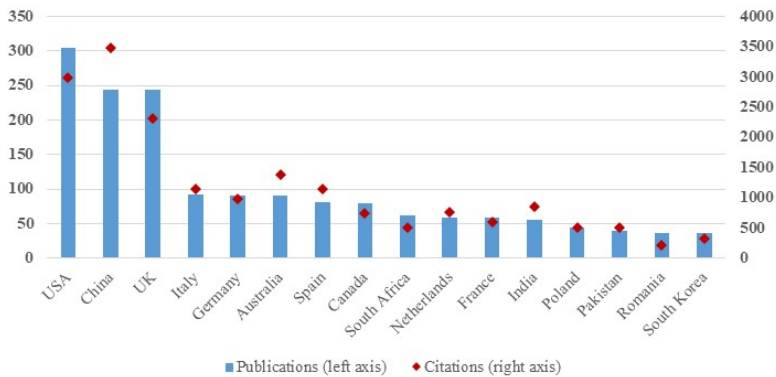
Affiliations of published works on SF



Affiliations of documents citing the literature on SF

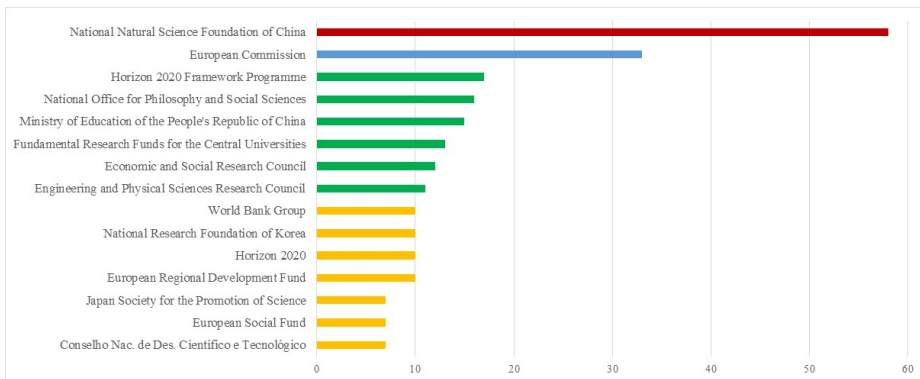
Source: own representation

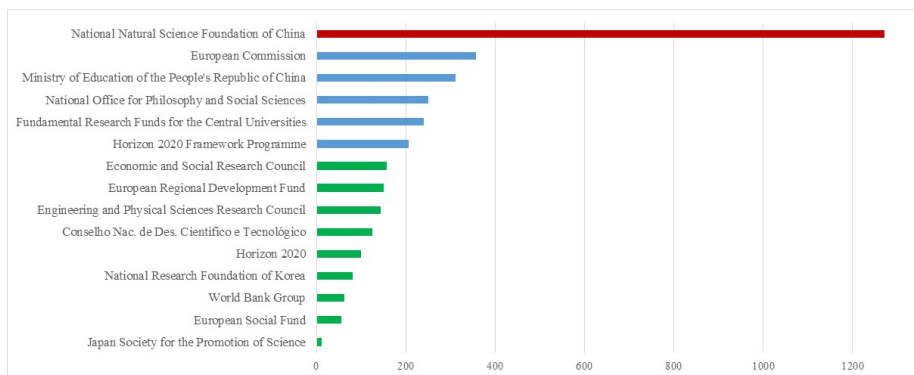
Although Anglo-Saxon institutions are at the top of the document counts by author's affiliation (1st, 3rd and 4th place), as seen in Figure 5, it seems that the United States is the most productive country of literature on SF (with more than 300 documents), as seen in Figure 6. With regard to the affiliations of authors that publish works which cite the exiting literature on SF, Chinese institutions dominate all three places. In fact, as also confirmed in Figure 6, there is an important gap between published works and citing works in China.

Figure 6. The most productive countries (no. of documents)

Source: own representation

With regard to the institutions that provide funds which support the production of this literature (see Figure 7), a Chinese body is, by far, the most generous sponsor being accounted for 58 documents (followed by the European Commission, mentioned in 33 documents). The next cluster of sponsors is formed by 6 institutions which financed the production of 10 to 20 SF related documents.

Figure 7. Top funding sponsors (no. of documents)*Sponsors of authors publishing works on SF*

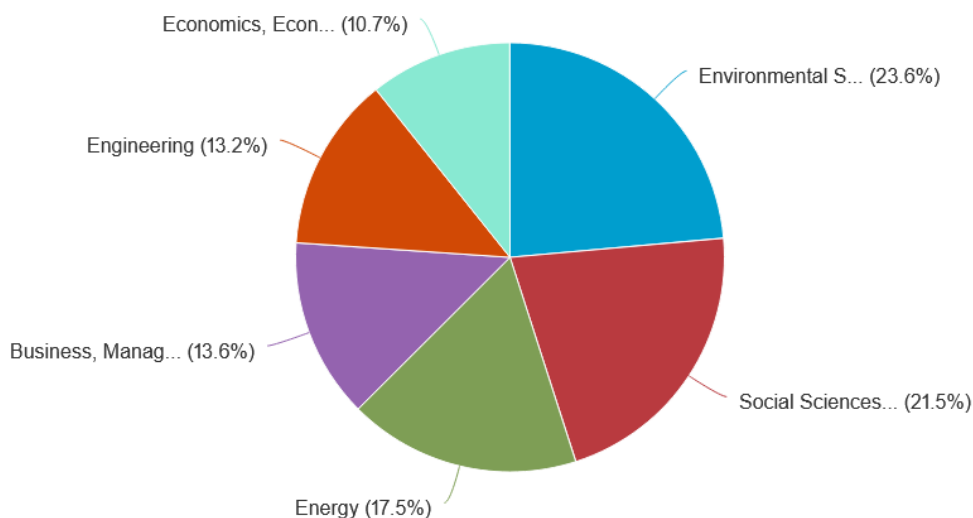


Sponsors of authors publishing documents citing the literature on SF

Source: own representation

Figure 8 reveals a kind of homogeneous dispersion of documents by subject area with the Environmental science (833 documents), Social Sciences (758) and Energy (618) being the most counted areas in this regard.

Figure 8. Distribution of subject areas



Source: own representation

We also performed a citation analysis, given that the citation is “the most frequent method used as a measure of the influence of an author, a journal or a paper, since it allows quick identification of important works in the field” (Niñerola, Sánchez-Rebull and Hernández-Lara, 2019, p. 6). In total, there are 20348 individual research works (since 1993 and up to 2021). Going back to

Figure 3, one can notice the evolution in the number of citations. Although it had a sluggish start in the first one and a half decade, starting with 2007/2008 the number of works citing the 1915 papers started to grow significantly. Within the countries of origin of the authors citing the works related to SF, China is the leader, followed closely by the US and the UK (as seen in Figure 6).

Table 1 reveals a highly concentrated citation structure of the academic literature on SF. On the one hand, we have very few papers registering a high number of citations. Specifically, around 1% of the documents (23 papers) have more than 100 citations each, this making them responsible for 27.04% of the total citations (6246 citations). On the other hand, we have a lot of documents that are poorly cited (1115 papers with less than 4 citations) or have not been cited at all. Specifically, around 41% account for less than 5% of the total citations. As ‘a rule of thumb’, around 20% of the papers on SF related topics are responsible for about 80% of the total citations (while the remaining 80% of the papers account for the other 20% of the citations), hence the steep slope of the blue line (‘citations’) in Figure 3.

Table 1. General citation structure

No. of citations	No. of papers	% (of papers)	$\Sigma\%$ (of papers)	$\Sigma\%$ (of citations)
≥ 300	3	0.16%	0.16%	4.58%
200-299	6	0.31%	0.47%	10.93%
150-199	6	0.31%	0.78%	15.30%
100-149	23	1.20%	1.98%	27.04%
75-99	27	1.41%	3.39%	37.19%
50-74	40	2.09%	5.48%	47.58%
25-49	140	7.31%	12.79%	68.18%
10-24	295	15.40%	28.20%	87.80%
5-9	260	13.58%	41.78%	95.21%
≤ 4	1115	58.22%	100.00%	100.00%
Sum	1915	100.00%	--	--

Source: own representation

From the 4369 authors that have produced SF related literature, 159 appear in at least two papers. Precisely 59 appear in at least three papers (Thomas Lagoarde-Segot from the KEDGE Business School, Talence, France, and Sangbing Tsai from Wuyi University, Wuyishan, China, being the most productive ones, with 7 papers each). Among the most influential authors (those that have cited in one or more of their works, one or more papers from the panel of 1915 documents), we noticed Chan, Albert P.C., from the Hong Kong Polytechnic University, which has provided 53 citations in Scopus.

In the following paragraphs we will discuss the results of the analyses performed using VOSviewer. Using the data exported from Scopus, we will look into the most common keywords used to classify the papers. Following van Eck and Waltman (2010), a link is a connection between two items (e.g., co-occurrence links between keywords). Each link has a strength represented by a number, and the higher this number is, the stronger the link is. In our case, the strength of a link indicates the number of publications in which two keywords occur together (in terms of co-occurrence links).

In our selected sample of 1915 documents with SF related literature, we have 6790 keywords. Among these, only 2131 appeared at least twice (31.38%). A number of 709 keywords (10.44%) appeared at least five times, 322 (4.74%) at least ten times, 136 (2.0%) at least twenty time and only 78 keywords (1.14%) appeared more than 30 times. The most occurred five keywords within these 78, are displayed in Table 2.

Table 2 shows that ‘finance’ is the most encountered term in our sample, followed closely by ‘sustainable development’ and by far by ‘sustainability’. ‘Finance’ has also the highest value of the total link strength, meaning that it has been linked with other terms and in many occasions.

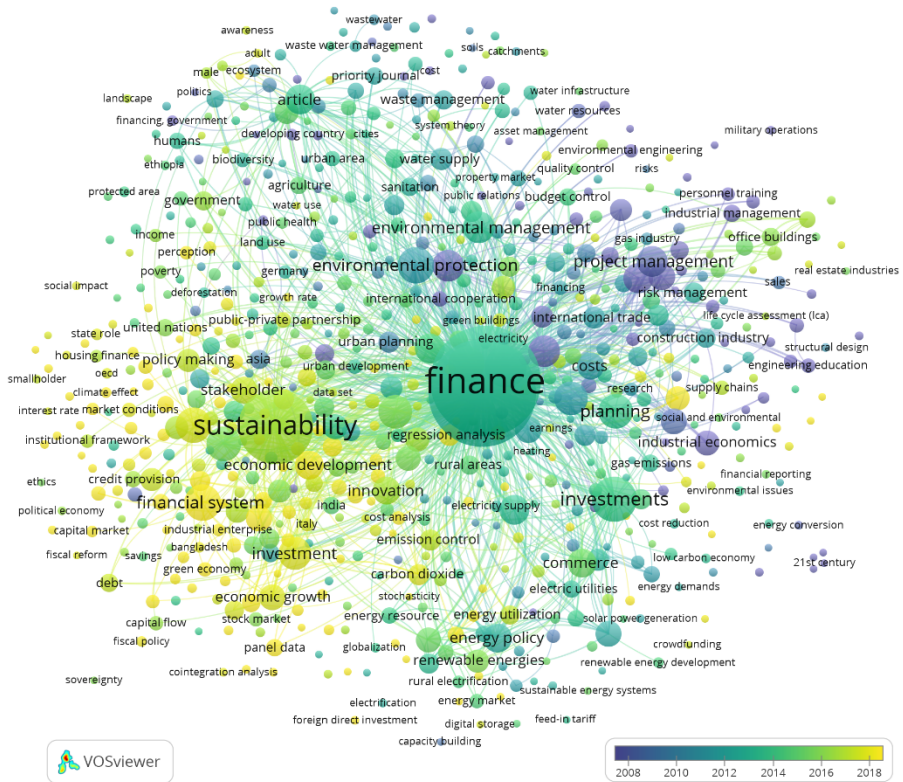
Table 2. The most occurred keywords

Keyword	Frequency¹⁾	LS²⁾
Finance	940	7766
Sustainable development	898	7332
Sustainability	440	3594
Investments	156	1547
Economics	135	1403
Environmental protection	107	1259
Financial system	102	796

Note: ¹⁾ the total number of occurrences; ²⁾ the total link strength

Source: own representation

We can notice in Figure 9 that the higher the number of occurrences of a keyword, the biggest the node of the network. In addition, a small distance between two nodes is indicating that there is a strong relationship between them (frequently appearing together).

Figure 9. Analysis of Keywords in VOSviewer

Source: own representation

VOSviewer also allows us to analyze the occurrences of the keywords over time. Following van Eck and Waltman (2010), the color of the node indicates the average number of publications per year in relation to the node. The blue color is encountered more on the right side of the figure. Here, we can find the words that appeared especially at the beginning of our period of analysis (from 1991 until 2010). The keywords in green nodes, positioned around the center of the network, are specific to the period 2010-2014, while the terms in yellow bubbles are encountered in the more recent literature. Notice that in the first years when SF related documents were published (the figure's blue section), the most encountered keywords included: 'technology', 'environmental management' and 'project management', 'industrial economics', 'societies and institutions', 'public policy'. This may suggest that the focus of the authors was not exclusively on sustainable finance specific issues, but more on grasping and understanding the concept of 'sustainable development' and analyzing it alongside other possible ardent topics in the society (with some possible implications of financial nature).

In the more recent years (the figure's yellower section) new and especially financial related terms pop out: 'sustainability', 'investments', 'financial system', 'financial crisis', 'financial performance', 'banking', 'innovation', etc. This clearly suggests the appearance of more focused researches on sustainable finance. Financial issues are being analyzed not as residual topics in a research, but more as a leading subject alongside social and environmental related aspects. Another interesting observation derives from the geographical references in the studies. While in the first years, the studies do not mention any specific countries or regions among the keywords (possible suggesting rather general studies), more recently the papers appear to be more specific, referring, among others, to: China, European Union, Belgium, Europe, Eurasia, Korea, United States, United Kingdom.

5. CONCLUSIONS

The topics that somehow relate to 'sustainable finance' (SF) are becoming more attractive for academics and publishers as these appear in increasingly more research materials (mostly articles). This paper uses a dataset of 1915 SF related documents extracted from Scopus (after a rigorous selection process, which was explained in the content of the paper) to perform a bibliometric analysis.

To summarize, the main takeaways of the manuscript are:

a) the 1915 papers (summing 6790 keywords) have been developed by a total of 4369 authors (and/co-authors) starting from the works of other 67740 individual references;

b) although sluggish in the beginning (in the early 1990s), the productivity in terms of research papers increased substantially a decade later (with an accelerated growth in the more recent years);

c) the citations of the 1915 papers grew even more rapidly, with most of the citations and paper cited originating in European countries (although with a delay of about five years on average since an article's publication, as this is quite normal in terms of spread of information);

d) among top publishers we distinguish the journals: *Sustainability* (for its high number of papers) and *Energy Policy* (for its longevity) – an analysis of the geographical origin of the top publishers reveals their European nature;

e) in terms of territorial distribution, while Anglo-Saxon institutions are at the top of the document counts by author's affiliation, it is the United States that ranks first place in terms of productivity and volume of citations (surpassing the UK);

f) a Chinese institution is, by far, the most generous sponsor for the production of scientific output on the topic, after which the European Commission ranks second place;

g) around 20% of the papers on sustainable finance related topics are responsible for about 80% of the total citations;

h) ‘finance’ is the most encountered keyword in our papers, followed closely by ‘sustainable development’ and by far by ‘sustainability’;

i) in the early 1990s, the authors may not have focused on sustainable finance issues *per se*, but more on understanding the concept of ‘sustainable development’ in general, while in more recent times the papers may have been more focused on SF exclusively;

j) in addition, while in the first years, the studies may have been more general (given that these papers did not mention any specific countries or regions among the keywords), more recently the papers seem to be more specific, referring, among others, to: China, the European Union, Belgium, Europe, Eurasia, Korea, the US, the UK.

This paper may help researchers and practitioners to better understand the topic at hand and the frontier trends in this field and provide useful information for further investigation and publication strategies. In addition, the study could serve in identifying gaps, understanding the focus and gauging the level of knowledge on one of the most ardent topics at hand. This topic is even more relevant if we were to consider the ambition of the European Commission to mobilise at least €1 trillion in sustainable investments over the next decade through the European Green Deal Investment Plan, also referred to as Sustainable Europe Investment Plan.

A bibliographic study alone cannot provide enough information on which a country introduces more efficient sustainable finance policies. However, it can be used as an early indicator about the attention being given to estimating the short- and long-term impacts of new sustainability goals and policies (as this is even more important given the tough goal to make Europe climate neutral by 2050, established by the European Commission in the European Green Deal). Taking into consideration the economic conditions of Central and Eastern European countries and their pursuit of growth in a durable manner, it is essential for them to analyze deeper and from more diverse points of view what will be the impact of common EU policies aiming at climate change and sustainability.

ACKNOWLEDGEMENTS

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ACTORS / SUBJECTS OF THE CROSS-BORDER INSOLVENCY

CRISTINA BANCU

*Moldova State University
Chisinau, Republic of Moldova
cristina.bancu.usm@gmail.com*

Abstract

The article insists on the legal solutions of the subjects/actors of cross-border insolvency, a complex issue that involves elements of legislative systems and legal instruments both at national and international level. In this study, there were researched issues regarding the existing regulatory framework of the conditions to become an actor/subject of the cross-border insolvency 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 resolve cross-border disputes and conflicts, but which unfortunately does not cope to the globalization trends. The analysis of the European framework that regulates the conditions for insolvency proceedings in international jurisdiction as well as the establishment of creditors' defense limits is not always the shield of creditors outside the EU, which in fact leads to cross-border insolvency conflicts. The continuous expansion of international trade will inevitably lead to the emergence of new cases of insolvency, we cannot overshadow the consequences of the health crisis (Covid 19) in the modern world that inevitably comes with new waves of liquidation of large companies. The author finally comes with conclusions that can be implemented in both international and national regulations with regard to parties involved in the insolvency process which comes out to be difficult and involved international issues and problems. Additionally, it will be marked out of threatens of administrator and founders to bear financial liability as result of the indirect liability for the companies' debts.

Keywords: *cross-border insolvency; jurisdiction; European case-law; harmonization; cross-border business relations.*

JEL Classification: K33

1. INTRODUCTION

In this research the author has as main goal to analyze the particularities of the subjects involved in the procedure of cross-border insolvency.

According to the opinion of Manko (2013) in his article '*Cross-border insolvency in the EU*' there are several potentially conflicting interests: those of the creditors of an insolvent company, its shareholders and its customers, as well as the general economic interest in avoiding the winding down of companies which are still potentially viable. The number of the companies that go bankrupt is increasing early, in European Union (EU), there are around 200 000 corporate

bankruptcies filed early. Manko (2013) had shown the comparative aspects of the cross-border framework in different countries. As per example in United Kingdom is considered to be predictable, flexible and to prioritize reorganization, on the other hand in civil law countries the framework in cross border insolvency is more punitive for the debtor. In some countries like Germany and Australia the government subsidizes the employees' salaries in the first months of filed bankruptcy, whereas in France the workers' salaries claims are preferred to all other claims, also with regard to the procedural law, the roles of the courts and creditors also differs, in France, the insolvency law is mainly in charge, in England the creditors have a predominant position, and in Germany have an intermediate approach (Manko, 2013).

In the Republic of Moldova, the institution of insolvency is regulated by art. 252 of the Insolvency Law (Law no 149/2012): *"If in another state an insolvency process has been opened against a debtor who has assets on the territory of the Republic of Moldova, the enforcement of his assets may be initiated only if there is a bilateral agreement between the respective state and the Republic of Moldova on cross-border insolvency"*.

With regard to the *legal characters* of the insolvency procedure, then it can point to the following:

- a) Collective – refers to the fact that all persons who would have a contractual connection with the debtor are concerned;
- b) Competition – i.e., the satisfaction of creditors' claims takes place in strict accordance with their ranks, as well as the rank of claims;
- c) Incompatible – with the individual enforcement of the creditor against the debtor.

In support of the argumentation of the importance of legislating the cross-border side in the insolvency law would be, as the authors in the field say: *"avoiding the temptation of the parties to transfer their assets to another state, in an attempt to obtain a more favorable legal situation"*.

Based on the constitutional principle of sovereignty, the legal force of an enforceable title is, in principle, limited to the territory of the state from which the authorities issuing that title belong or which have conferred on its enforceable power. Summing up to the above, an insolvent debtor can thus avoid forced execution by moving his assets to the territory of another state, a condition in which both the process and the insolvency procedure would be difficult and would violate the principle of the reasonable term of judging the dispute that arose. It can not be excluded here the fact that the legal regulations of that state would make the process of recovering assets more difficult, if not, would be in some cases impossible. In this case, a new application to the court would be required to obtain a new enforceable title that would be recognized and liable to be executed, or this procedure involves costs and risks, including financial ones.

In this respect, by way of *lege ferenda*, I opt for the modification of the legal provisions of the normative act regulating the insolvency, by introducing certain provisions that would regulate a preferential regime of recognition of the decisions given by the insolvency court of the Republic of Moldova in relation to the assets that are in another state, a regime that would consist in their execution on the territory of the foreign state. Moreover, all the assets that were disposed of after their transfer to the foreign state should be liable to restitution to the insolvency administrator, and if this is not possible, then to return their value from the debtor's patrimony, including the forced dispossession of other assets that would amount to the value of the alienated ones.

When the introductory request is received, the law orders the court to apply *"the necessary measures to prevent the change of the state of the debtor's assets during the period before the insolvency process was initiated"*.

All the procedures of individual prosecution of creditors, as well as those of forced execution are suspended, because of the interruption of the limitation period, in accordance with the provisions of the Civil Code of Republic of Moldova.

Although in the judicial practice of Republic of Moldova, the insolvency courts did not collide with the insolvency at the cross-border level, we consider it auspicious to reiterate once again about the complexity and the degree of difficulty presented by the insolvency process (in general), and on this occasion we also refer to a possible novation of the current insolvency law, which would also regulate the insolvency of a commercial company(s) that would have their registered office in the Republic of Moldova and at the same time would dispose of certain assets, even real estate, which would be outside the borders of the country. Another reason would be the foreign elements of the insolvency of companies carrying out *'business activities with cross-border effects, which would be liable to affect the proper functioning of the internal market'* (Popovici, 2016).

As it is mentioned in the specialized literature, *"after the opening of the insolvency proceedings, the forced executions can no longer be carried out either against the debtor or against his debtors, only in the procedure: the debtor can collect his debts forcibly only through / or with the consent or supervision of the judicial administrator or liquidator, and against the debtor's wealth, the enforcement cannot be solely collectively, the distribution of the debtor's assets or among his creditors or his reorganisation with the aim of covering the debts constituting precisely the essence of the insolvency proceedings"* (Popovici, 2016).

With the opening of insolvency proceedings, a *'framework for all foreclosures, including cross-border enforcements'*, is also formed (Popovici, 2016).

According to the Regulation (EU) 2015/848 of the European Parliament and of the Council of 20 May 2015 on insolvency proceedings lays down EU-wide rules for determining:

- a. the court having jurisdiction to open insolvency proceedings;
- b. the applicable national legislation;
- c. recognition of the court's decision when a company, a trader or a natural person becomes insolvent.

The Regulation also applies to public collective proceedings, including interim proceedings, which are based on insolvency law and were, for the purposes of salvage, debt adjustment, reorganization, or liquidation: (a) a debtor's assets are totally or partially frozen and an insolvency practitioner is appointed; (b) the assets and activities of a debtor are subject to control or supervision by a court; or (c) a temporary stay of an individual enforcement procedure is granted by a court or by operation of law, to allow for negotiations to be conducted between the debtor and his creditors, provided that the procedure for which the stay is ordered: provides for appropriate measures to protect the insolvency estate and, if no agreement is reached, precede one of the procedures referred to in (a) or (b).

Where the proceedings referred to in this paragraph can be opened where insolvency is merely alleged, the objective of the proceedings shall be to avoid the debtor's insolvency or the cessation of his business.

The regulation shall not apply to proceedings relating to: (a) insurance undertakings; (b) credit institutions, investment firms and other firms, institutions, and undertakings, in so far as they are covered by Directive 2001/24/EC (Regulation (EU) 2015/848); or (c) collective investment undertakings. (Regulation (EU) 2015/848) When we refer to cross-border insolvency, the first question that arises is what the 'Member State' entails.

Under Regulation (EU) 2015/848, the cross-border insolvency hits to some principles when the local law shall be applied as "The Member State in which the assets are situated" means:

1) in the case of registered shares of companies other than those referred to in (ii), the Member State in which the company which issued the shares has its registered office.

2) in the case of financial instruments, the ownership of which is proved by an entry in a register or in an account held by an intermediary or in the name of an intermediary ('book-booked securities'), the Member State in which the register or account in which the entries were entered is kept.

3) in the case of cash funds held in the accounts of a credit institution, the Member State indicated in the IBAN of the account or, in the case of cash funds held in the accounts of a credit institution which does not have an IBAN, the Member State in which the credit institution holding the accounts has its central administration or, if that account is opened with a branch, a subsidiary or other

head office, the Member State in which the branch, subsidiary or head office is situated;

4) in the case of assets and rights which the owner or holder enters in a public register other than those referred to in point (i), the Member State under whose authority the register is kept.

5) in the case of European patents, the Member State for which the European patent is granted.

6) in the case of copyright and related rights, the Member State in which the rightsholder has his or her habitual residence or registered office.

7) in the case of tangible property other than those referred to in points (i) to (iv), the Member State in whose territory the goods are situated.

8) in the case of claims against third parties other than those relating to the assets referred to in point (iii), the Member State within the territory of which the third-party debtor has the center of his principal interests, determined in accordance with Article 3(1) (Regulation (EU) 2015/848).

We also tend to mention the following groups of subjects, under Regulation (EC) 848/2015:

1. Insolvency practitioner;
2. Group Coordinator's;
3. Creditor local;
4. Foreign creditor;
5. Debtor in possession;
6. Group of companies.

2. THE GROUP OF SUBJECTS INVOLVED IN THE PROCEDURE OF CROSS-BORDER INSOLVENCY

A. "Insolvency Practitioner"

The notions of subjects of the cross-border insolvency are tightly connected to the "Insolvency practitioner" (European Commission, 2006), or "*Insolvency practitioner*" (EN); *Liquidateur judiciaire* (FR) *Insolvenzverwalter* (DE); which according to art. 2 Regulation (EU) 2015/848 means any person or body whose function, including provisional, is to:

- 1) verify and admit claims submitted in insolvency proceedings;
- 2) represent the collective interest of creditors;
- 3) manage, either in whole or in part, the debtor's assets that have been frozen;
- 4) liquidate the assets;
- 5) supervise the management of the debtor's business (Regulation (EU) 2015/848).

Where the insolvency proceedings concern two or more members who are part of a group of companies, the insolvency practitioner appointed in the proceedings concerning a group member shall cooperate with the insolvency

practitioner appointed in the proceedings concerning another member of the same group, in so far as such cooperation is appropriate to facilitate the effective administration of the proceedings, it is not incompatible with the rules applicable to such proceedings and does not give rise to any conflict of interest.

Such cooperation may take any form, including the conclusion of agreements or protocols. In implementing cooperation, insolvency practitioners shall communicate to each other, as soon as possible, any information which may be relevant to the other procedure, provided that appropriate measures are taken to protect confidential information; but also examine the possibilities of coordinating the administration and supervision of the activity of the group members who are concerned by the insolvency proceedings, and if this possibility exists, coordinates the respective administration and supervision and, last but not least, the possible possibilities to reorganize the group members who are concerned by the insolvency proceedings, and if this possibility exists, coordinates the proposal and negotiation of a coordinated reorganisation plan.

To facilitate the coordination of the main, territorial and secondary insolvency proceedings opened with regard to the same debtor, there is always communication with the courts between practitioners, which implies that:

- they cooperate and communicate with any court which has pending an application for the opening of secondary insolvency proceedings;
- it cooperates and communicates with the court which has pending an application to open main insolvency proceedings;
- the insolvency practitioner in the territorial or secondary insolvency proceedings cooperates and communicates with the court which has pending an application to open another territorial or secondary insolvency proceedings.

In so far as such cooperation and communication are not incompatible with the rules applicable to each of the proceedings and do not entail any conflict of interest.

When we refer to the insolvency practitioner, we cannot omit *the term: 'Group coordinator'*, who is a person eligible under the law of a Member State to act as an insolvency practitioner.

The *Coordinator* may not be one of the insolvency practitioners appointed to act in relation to any of the members of the grouping and shall have no conflict of interest regarding the members of the group, their creditors and the insolvency practitioners appointed in relation to any of the members of the group. Additionally, it identifies and makes recommendations for the coordinated conduct of insolvency proceedings; proposes a group coordination plan which highlights, illustrates, and recommends a full set of measures corresponding to an integrated approach to resolving the insolvency situations of the group companies. The plan may include proposals on the measures to be taken to restore the economic performance and financial viability of the group or

any part of it; the settlement of disputes within the group concerning the operations within the group and the revocatory actions; agreements between insolvency managers of the insolvent companies in the group.

The coordinator may also:

a) be heard and attended, by attending meetings of creditors, in any open proceedings concerning another company of the same group.

b) to mediate in any dispute between two or more of the insolvent practitioners of the members of the group.

c) submit and explain its plan for coordinating the group of persons or bodies to whom it is required to report under its national law.

d) to ask any insolvency practitioner in relation to any of the members of the group for information which is or might be useful when identifying and formulating strategies and measures for the coordination of the procedure; and

e) to apply for a stay for a period of up to six months of the proceedings opened in respect of any member of the group, provided that such a stay is necessary to ensure the correct implementation of the plan and is to the satisfaction of the creditors in the proceedings for which the stay is requested, or that it requests the revocation of any such stay. Such a request shall be addressed to the court which initiated the proceedings for which the suspension is requested.

f) The plan referred to in point (b) of paragraph 1 may not contain recommendations relating to any consolidation of insolvency proceedings or assets. It is important, however, to note that the tasks and rights of the coordinator as defined in this Article do not extend to any member of the group who does not participate in the group coordination procedure. And when the coordinator considers that the performance of its tasks requires a significant increase in costs compared to the cost estimate, and when the costs exceed 10% of the estimated costs, the coordinator must inform the participating insolvency practitioners without delay and seek the prior approval of the court that opened the group coordination procedure according to the Article 59 of the Regulation (EU) 2015/848.

B. „Local Creditor”

Under the Regulation, the definition of '*local creditor*' is identified, which means a creditor whose claims against a debtor arose because of or in connection with certain transactions carried out in an establishment situated in a Member State other than that in which the debtor's center of main interests is located.

The Regulation should also apply to procedures granting a temporary stay of enforcement actions brought by individual creditors where such actions may affect negotiations and impede the prospects for restructuring of the debtor's economic activity. Such procedures should be without prejudice to the insolvency estate and, if no agreement is reached on a restructuring plan, should be prior to the other procedures covered by this Regulation.

The Regulation should apply to proceedings the opening of which is subject to the publicity obligation to allow creditors to be informed of the proceedings and to register their claims, thereby ensuring the collective nature of the proceedings, and to give creditors the opportunity to challenge the jurisdiction of the court which opened the proceedings.

Therefore, insolvency proceedings that are confidential should not fall within the scope of this Regulation. While such proceedings may play an important role in some Member States, it is impossible for a court or creditor in another Member State to know that such proceedings have been opened because of their confidential nature, making it difficult to order recognition of their effects across the Union.

The collective procedures covered by this Regulation should include all or a significant part of the creditors to whom the debtor owes all or a substantial proportion of its outstanding debts, provided that the claims of creditors who are not involved in such proceedings remain unaffected. Procedures involving only the financial creditors of a debtor should also fall within the scope. Procedures that do not include all creditors of a debtor should be procedures aimed at rescuing the debtor. Proceedings leading to the final cessation of the debtor's business, or the liquidation of his assets should include all creditors of the debtor. In addition, the fact that some insolvency proceedings for natural persons exclude certain categories of claims, such as maintenance claims, from the possibility of discharge of debt should not mean that such proceedings are not collective (Regulation (EU) 2015/848).

Firstly, the Regulation gives the insolvency practitioner of the main insolvency proceedings the opportunity to make a commitment to the local creditors, according to which they will be treated as if a secondary insolvency procedure had been opened. This commitment must meet several the conditions laid down in the Regulation, be approved by a qualified majority of local creditors. Where such a commitment has been made, the court seized of an application to open secondary insolvency proceedings should be able to refuse that application where it considers that such commitment adequately protects the general interests of local creditors. When assessing those interests, the court should consider that the commitment has been approved by a qualified majority of local creditors.

For the purposes of making a commitment to local creditors, assets and rights located in the Member State where the debtor has an establishment should form part of a subcategory of the insolvency estate and, when distributing them or the income received from their realization, the insolvency practitioner in the main insolvency proceedings should respect the priority rights that creditors would have enjoyed if a secondary insolvency proceeding in that Member State.

Any creditor who has his or her habitual residence, domicile or registered office in the Union should have the right to register his claim on the debtor's

assets in any ongoing insolvency proceedings in the Union. This should also apply to tax authorities and social security institutions (Regulation (EU) 2015/848).

The Regulation should not prevent the insolvency practitioner from making claims on behalf of certain groups of creditors, for example employees, where provided for by national law. However, to ensure equal treatment of creditors, the distribution of proceeds should be coordinated. Each creditor should be able to keep what he has received during the insolvency proceedings but should not be entitled to participate in the distribution of all the assets in other proceedings unless creditors of the same rank have obtained, in the same proportion, an equivalent dividend.

It is essential that creditors who have their habitual residence, domicile or registered office in the Union are informed of the opening of insolvency proceedings concerning the assets of their debtor. To ensure a rapid transmission of information to creditors, Regulation (EC) No 2020/1784 entry into force on 1st July 2022 that repealed the Regulation (EC) No 1393/2007 requires Member states to provide a service enabling the addressee of the document to be located or to assist in transmitting the documents that are not available in another Member State. The use of standard forms available in all the official languages of the institutions of the Union should facilitate the burden on creditors to lodge claims in proceedings opened in another Member State. The consequences of not fully duplicating the standard forms should be governed by national law (Regulation on service of documents).

Any creditor may appeal to the court against the decision to open the main insolvency proceedings on grounds of international jurisdiction.

The decision of opening the main insolvency proceedings may be challenged by the parties, according to their jurisdiction. So, according to the Article 8 of the

The opening of insolvency proceedings shall be without prejudice to the *rights in rem* of a creditor or third party over tangible or intangible, movable, or immovable property — both individually determined and in individual assets, the composition of which may change — belonging to the debtor and which are located in the territory of another Member State at the time of the opening of the proceedings.

The rights include in particular:

1. the right to execute or to demand execution of assets and to obtain material gains from such an execution or from the fruits of those assets, by virtue of a lien or mortgages;
2. the exclusive right to enforce a claim, in particular because of the pledge or assignment of the claim by way of security;
3. the right to claim assets and/or to demand their return from the hands of whoever owns them or uses them against the will of the party entitled;

4. the real right to perceive the fruits of an asset.

The opening of insolvency proceedings against the buyer of an asset shall be without prejudice to the rights of the seller of that asset based on a reserve of ownership if at the time of the opening of proceedings the asset is situated within the territory of a Member State other than that in which the proceedings were opened. The opening of insolvency proceedings against the seller of an asset, after the asset has been handed over, shall not constitute grounds for termination of the sale and shall not prevent the buyer from acquiring ownership if at the time of the opening of proceedings the asset sold is situated within the territory of a Member State other than that in which the proceedings were opened.

Article 23 of Regulation (EU) 2015/848 provides that a creditor who, after the opening of the proceedings provided for in Article 3(1), obtains by any means, by way of enforcement, all, or part of his claim on the assets of a debtor situated in the territory of another Member State must return to the insolvency practitioner what he has obtained, subject to Articles 8 and 10. 2. To ensure equal treatment of creditors, a creditor who has obtained during one insolvency proceedings a dividend on his claim shall participate in distributions made in another proceeding only if creditors of the same rank or category have obtained an equivalent dividend in the latter proceedings (Regulation (EU) 2015/848).

Local creditors may also apply to the courts of the Member State where the main insolvency proceedings have been opened to require the insolvency practitioner in the main insolvency proceedings to take any appropriate measures necessary to ensure compliance with the terms of the commitment available under the law of the State of the opening of the main insolvency proceedings.

At the same time, local creditors may apply to the courts of the Member State where secondary insolvency proceedings could have been opened to require them to take interim or protective measures to ensure that the insolvency practitioner complies with the terms of the commitment.

Article 45 of Regulation (EU) 2015/848 stipulates that a creditor may register his claim in the main insolvency proceedings and in any secondary insolvency proceedings.

Therefore, the insolvency parties in the main insolvency proceedings and in the secondary proceedings will register in other proceedings the applications for the admission of claims that had already been registered in the proceedings for which they were appointed, provided that this serves the interests of the creditors in the latter proceedings, subject to the creditors' right to oppose such registration or to withdraw the registration of applications for the admission of claims, where the applicable law provides for this possibility (Regulation (EU) 2015/848).

C. "Foreign creditor"

However, the local creditor is different from another subject, called a *'foreign creditor'*, which means a creditor who has his habitual residence,

domicile, or registered office in a Member State other than the State in which the proceedings were opened, including the tax authorities and social security authorities of the Member States.

If we are to refer to the foreign creditor, Regulation (EU) 2015/848 provides that any foreign creditor may apply for the admission of the claim in the insolvency proceedings, by any means of communication that is accepted by the law of the state in which the proceedings were opened. Representation by a lawyer or other legal practitioner is not compulsory for the sole purpose of filing claims.

Also, article 55 of the Regulation states that the foreign creditor may apply for the admission of claims using the standard form for the submission of the application for the admission of claims, to be established in accordance with Article 88. The form shall be entitled 'Lodgment of applications for the granting of claims', a name which exists in all the official languages of the institutions of the Union.

This formula r-type of application shall contain the following information:

1. the name, correspondence address, e-mail address, if any, personal identification number, if any, as well as the bank details of the foreign creditor;

2. the amount of the claim, specifying the principal payment and, where appropriate, the interest, and the date on which the claim arose and the date on which it became due, if these dates differ;

3. whether interest is charged, the interest rate, its legal or contractual nature, the period for which interest is charged and the amount of capitalized interest;

4. if costs are incurred when the claim is declared, before the opening of the proceedings, the amount, and details of those costs;

5. the nature of the claim;

6. whether preferential creditor status is claimed and the basis for such a claim;

7. if it is claimed that there is a security in rem or a reservation of ownership in respect of the claim and, if so, which assets are covered by the alleged guarantee, the date on which the security was given and, if the security was registered, the registration number; and

8. whether a set-off is claimed and, if so, the amounts of the reciprocal claims existing at the time of the opening of the insolvency proceedings, the date on which the claims arose, and the net amount of the compensation claimed.

The standard application form shall be accompanied by copies of supporting documents, if any. Applications may be submitted in any official language of the institutions of the Union. The court, the insolvency practitioner or the debtor in possession may require the creditor to provide a translation into the official language of the State in which the insolvency proceedings were opened or, where there is more than one official language in that Member State,

into the official language or one of the official languages of the place where the insolvency proceedings were opened or into another language which the Member State has indicated that it can accept. Each Member State shall indicate whether it accepts any official language of the institutions of the Union, other than its own, for the submission of applications.

Applications shall be submitted within the time limit laid down by the law of the State in which the proceedings were opened. In the case of a foreign creditor, that period shall not be shorter than 30 days from the date of publication of the decision to open insolvency proceedings in the insolvency register of the State where the proceedings were opened. Where a Member State invokes Article 24(4), *'Member States shall not be obliged to include in their insolvency registers the information referred to in paragraph 1 of this Article concerning natural persons who do not pursue a self-employed or commercial activity, nor shall they make that information available to the public through the system of interconnection of those registers, provided that known foreign creditors are informed'*, that period shall not be less than 30 days after the creditor has been informed pursuant to Article 54 (Regulation (EU) 2015/848).

Where it has doubts about an application submitted in accordance with this Article 54, the court, the insolvency practitioner, or the debtor in possession shall give the creditor the opportunity to provide additional evidence of the existence and amount of the claim (Regulation (EU) 2015/848). The local creditor and the foreign creditors have as main goal to collect the debt from insolvent debtor. The cross-border insolvency procedures give headaches ever to foreign creditors ever to local creditors as the main debtor has foreign element in seat location, assets' location, founders 'assets location and other elements. Further it will be discussed the debtor's role in cross-border insolvency procedures.

D. "Debtor/Debtor in possession"

'Debtor in possession' means a debtor against whom insolvency proceedings have been opened which do not necessarily involve the appointment of an insolvency practitioner or the full transfer of the rights and powers of administration of the debtor's assets to an insolvency practitioner and in which the debtor therefore retains all or at least part of its control over its assets and business (Regulation (EU) 2015/848).

The scope of this Regulation should be extended to procedures that promote the rescue of economically viable but failing undertakings and that give entrepreneurs a second chance. It should also cover procedures that provide for the restructuring of a debtor at a stage where there is only a likelihood of insolvency, as well as procedures that leave the debtor in full or partial control of his assets and business. This should also include procedures for the discharge of debts or the adjustment of debts in relation to consumers and self-employed

persons, for example by reducing the amount to be paid by the debtor or by extending the payment deadline granted to him.

As such procedures do not necessarily involve the appointment of an insolvency practitioner, they should be covered by this Regulation where they take place under the control or supervision of a court. In this context, the term 'review' should include situations where the court only intervenes following an appeal by a creditor or other interested parties (Regulation (EU) 2015/848).

The Regulation allows for the opening of the main insolvency proceedings in the Member State where the debtor's main interests are located. Those procedures are universal in scope and include all the debtor's assets. In order to protect different interests, the Regulation allows for the opening of secondary insolvency proceedings parallel to the main insolvency proceedings. Secondary insolvency proceedings may be opened in the Member State where the debtor has an establishment. The effects of secondary insolvency proceedings shall be limited to assets situated in that State. Unity within the Union shall be ensured by mandatory rules for coordination with the main insolvency proceedings. Where in a Member State other than that in which a legal person or a company has its registered office, main insolvency proceedings concerning that person or company have been opened, it should be possible to open secondary insolvency proceedings in the Member State in which the person or company has its registered office, provided that the debtor carries on an economic activity with human means and assets in that State, in accordance with the case-law of the Court of Justice of the European Union. This applies only to proceedings concerning a debtor whose center of main interests is situated in the Union (Regulation (EU) 2015/848).

Similarly, the presumptions that the registered office, the principal place of business and the habitual residence are the center of the main interests should be relative and the relevant court of a Member State should carefully check whether the center of the debtor's main interests is indeed in that Member State. In the case of a company, it should be possible to rebut that presumption where the company's central management is situated in a Member State other than that in which the registered office is situated and where a comprehensive assessment of all relevant factors establishes, in a manner verifiable by third parties, that the real center of management and supervision of the company and the center for the management of its interests are located in that other Member State (Regulation (EU) 2015/848).

In the case of a natural person who does not pursue a self-employed trade or profession, it should be possible to rebut that presumption, for example, where the majority of the debtor's assets are outside the Member State in which the debtor has his or her habitual residence or where it can be established that the main reason for the move was the opening of insolvency proceedings before the

new court, and where such an opening could significantly affect the interests of creditors whose business with the debtor took place before the move.

With the same objective of preventing the fraudulent or abusive use of the most favorable court search practice, the presumption that the center of the main interests is the place of the registered office, the principal place of business or the habitual residence should not apply if, in the case of a company, legal person or natural person, respectively, natural persons engaged in an economic or professional activity independently, the debtor has moved his registered office or principal place of business to another Member State within three months of the application for the opening of insolvency proceedings or, in the case of a natural person who is not self-employed or professional, if the debtor has moved his habitual residence to another Member State within six months of the application for the opening of insolvency proceedings.

In any event, if the circumstances of the case give rise to doubts as to the jurisdiction of the court, the court should require the debtor to provide additional evidence to substantiate its allegations and, where the law applicable to the insolvency proceedings so permits, to give the debtor's creditors the opportunity to present their views on jurisdiction.

If the court seized of the application to open insolvency proceedings finds that the center of the main interests is not situated in its territory, it should not open the main insolvency proceedings.

In addition, any creditor of the debtor should have an effective remedy against the decision to open insolvency proceedings. The consequences of challenging the decision to open insolvency proceedings should be governed by national law.

Article 5 of the Regulation (EU) 2015/848 provides that the debtor may challenge in court the decision to open the main insolvency proceedings on grounds of international jurisdiction, and the decision to open the main insolvency proceedings may be challenged by the parties other than those referred to in paragraph 1 or on grounds other than the lack of international jurisdiction, where national law so provides. For the protection of third-party acquirers, a debtor shall, by means of an act concluded after the opening of insolvency proceedings, order for consideration: (a) an immovable property; (b) by a ship or aircraft which is the subject of registration in a public register; or (c) of securities the existence of which requires entry in a register provided for by law, the validity of that act shall be governed by the law of the State in which the immovable property is situated or under whose authority the register is kept (Regulation (EU) 2015/848).

It will be welcomed to analyze the definition of a '*group of companies*', which is a parent undertaking, together with all its subsidiary undertakings.

The insolvency practitioner appointed in insolvency proceedings opened in relation to a company that is a member of a group of companies should be able

to apply for the opening of a group coordination procedure. However, in cases where required by the law applicable to the insolvency, that insolvency practitioner should obtain the necessary authorization before making such a request. The request should specify key elements of the coordination, in particular a brief description of the coordination plan, a proposal as to who should be appointed as coordinator and a summary description of the estimate of the costs of coordination.

The regulation creates a specific approach to address the insolvency of members of a group of companies. This includes:

1. rules obliging the different insolvency practitioners and the courts involved to cooperate and communicate with each other;
2. limited rights of standing for an insolvency practitioner in proceedings concerning another member of the same group;
3. a specific system for the coordination of procedures targeting the same group of undertakings ('group coordination procedures').

For members of a group of companies not participating in a group coordination procedure, this Regulation (EU) 2015/848 should also provide for an alternative mechanism to achieve a coordinated restructuring of the group. An insolvency practitioner appointed in proceedings relating to a group company should have standing to bring proceedings enabling him or her to apply for the suspension of any measure relating to the realization of assets in proceedings opened in relation to other group companies which are not subject to the group coordination procedure. It should only be possible to apply for such a stay if a restructuring plan is submitted for the group member companies in question, if the plan is advantageous to creditors in the proceedings for which the stay is requested and if the suspension is necessary to ensure the proper implementation of the plan.

And '*parent undertaking*' means an undertaking which controls, either directly or indirectly, one or more subsidiary undertakings. An undertaking which prepares consolidated financial statements in accordance with Directive 2013/34/EU of the European Parliament and of the Council is a parent undertaking.

As it was mentioned private international law has a big influence on the cross-border insolvency. One aspect that cannot be overlooked is, what would be the applicable law in the event of cross-border insolvency of subjects?

Unless otherwise provided in the Regulation (EU) 2015/848, the law applicable to insolvency proceedings and its effects shall be the law of the Member State within the territory of which the proceedings are opened.

The law of the State of the opening of proceedings shall indicate the conditions for the opening, conduct and termination of insolvency proceedings.

This shall determine:

(a) debtors against whom insolvency proceedings may be opened in relation to their status;

(b) the assets forming part of the insolvency estate and the regime applicable to the assets acquired by the debtor after the opening of the insolvency proceedings; (c) the powers of the debtor and the insolvency practitioner;

(d) the conditions governing the effectiveness of the set-off;

(e) the effects of insolvency proceedings on ongoing contracts to which the debtor is a party;

(f) the effects of insolvency proceedings on individual actions brought by creditors, except for lawsuits pending;

(g) the claims to be registered at the insolvency estate of the debtor and the arrangements for claims arising after the opening of insolvency proceedings;

(h) the rules governing the lodging, verification, and admission of claims;

(i) the rules governing the distribution of proceeds from the sale of assets, the ranking of claims and the rights of creditors who have obtained partial satisfaction after the opening of insolvency proceedings by virtue of a right in rem or because of a set-off;

(j) the conditions and effects of the closure of insolvency proceedings, by composition;

(k) the creditors' rights after the closure of the insolvency proceedings;

(m) the rules on the nullity, annulment, or unenforceability of legal acts detrimental to the insolvency estate.

At European Union level, cross-border insolvency proceedings benefit through the Regulation (EU) 2015/848 from a uniform legal framework aimed at ensuring the proper functioning of the market. To this end, a set of rules have been put in place to prevent the transfer of assets from one Member State to another to achieve a more favorable situation for the insolvency estate (Regulation on insolvency proceedings 2015a).

The Regulation (EU) 2015/848 is built around two types of insolvency and how they interact. According to art. 3 para. subject to Article 1 of the Regulation (EU) 2015/848, the main insolvency is proceedings which may be brought against the debtor only by the courts of the Member State in whose territory the center of his main interests is situated.

On the other hand, secondary insolvency is proceedings which may be opened by the courts of a Member State other than that in whose territory the center of the debtor's main interests is situated if that debtor has (and) an establishment within the territory of that State and if a main insolvency proceeding has previously been opened.

It can sometimes become important for practitioners to identify what are the depending criteria on which they can influence the nature and content of the other. In most cases, legal persons with cross-border activity may have totally

different property situations in the State where the center of main interests is found from those corresponding to those corresponding to the activity carried out in the territory of another Member State.

Both the debtor himself and the local creditors may have an interest in coordinating parallel proceedings in such a way that their legal effects do not lead to unfair results.

Whether we are talking about main insolvency or secondary insolvency, a first point to be mentioned is that the rules applicable to each of these proceedings are governed by the law of the Member State in whose territory the application for insolvency was made. This is clear from the wording of Article 7 para. (1) of the Regulation (EU) 2015/848.

'Unless otherwise provided in the Regulation, the law applicable to insolvency proceedings and its effects shall be the law of the Member State in whose territory the proceedings are opened (...).'

This text is corroborated by the provision in Article 66 of the Regulation no (EU) 2015/848 according to which:

'In its scope, the Regulation should provide for uniform rules of conflict of law replacing, within their scope, national rules of private international law. Unless otherwise specified, the law of the Member State of the opening of proceedings (lex concursus) applies. This conflict-of-law rule should be applicable to both the main insolvency proceedings and local proceedings. The Lex concursus determines all the effects of insolvency proceedings, both procedural and substantive, on those persons and legal relationships. It shall govern all the conditions relating to the opening, conduct and closure of insolvency proceedings (Regulation (EU) 2015/848).'

To refer to these legal provisions, I might conclude that insolvency proceedings initiated against the same debtor in several Member States are autonomous and that they should depend in their essence and structure only on the interests of the holder of the claim and on the conditions imposed by the applicable national law. More specifically, in such an interpretation, for example, secondary insolvency against a debtor may consist in the liquidation of assets situated in the territory of that Member State, whereas the main insolvency against the same debtor may have as its object the reorganisation of the business carried out in the State in which the center of main interests is located. In favor of this interpretation could be invoked including the provisions of Article 38 of the Regulation (EU) 2015/848, according to which:

'After the opening of the main insolvency proceedings (whatever nature it may have n.e.), the Regulation does not restrict the right to request the opening of insolvency proceedings (again, without limitations n.n.) in a Member State in which the debtor has an establishment.'

At the same time, the amendment to Article 27 of Regulation (EC) could also be supported in favor of this view by Regulation (EU) 2015/848. According

to the old legislation Regulation no 1346/2000, the secondary procedure could only have been one of liquidation, thus the most radical form of insolvency, since Annex B to which Article 27 expressly referred only to winding-up proceedings. In fact, Article 27 merely confirms the solution regulated in Article 3 para. No 3 of Regulation No 1346/2000 according to which 'where insolvency proceedings have been opened pursuant to paragraph 1, any insolvency proceedings subsequently opened under paragraph 2 shall be secondary proceedings. The latter must be winding-up proceedings' (Regulation on insolvency proceedings 2000b).

It should be noted that at present, art. 34 of Regulation no 34 is not the subject of this Regulation 848/2015, the correspondent of the former Article 27 of Regulation 1346/2000, no longer imposes such a limitation, so that the court seized should be, at least in theory, free to decide sovereignly both on the appropriateness of opening the procedure and on the nature of the type of insolvency. No such conclusion, although it might seem judicious, would be a rigorously accurate one.

Starting from the whole regulation and implicitly from the rationale for establishing rules common to cross-border insolvency proceedings, the above apparent conclusion obliges to serious nuances and circumstances, many of them confirmed, as we will show, including by the practice of the CJEU.

Article 48 of the Regulation underlines the idea that the main and secondary proceedings should contribute to the efficient management of the insolvency estate of the debtor or to the efficient realisation of the estate of assets, insofar as there is appropriate cooperation between the actors involved in parallel insolvency proceedings. The text reproduces and develops the guiding principle previously established by Article 20 of Regulation (EC) No 1346/2000. The same text confirms the predominant role of the main proceedings over any secondary proceedings, a status such as to have a significant effect on the relationship between the two types of proceedings (Regulation (EC) No 1346/2000).

3. CASE STUDY

Seised of this issue, the CJEU held in Case C-116/11, *Bank Handlowy vs Adamiak*, that 'under the principle of sincere cooperation laid down in Article 4(3) EU, the court having jurisdiction to open secondary proceedings is required when applying those provisions, to take into account the objectives of the main proceedings and to take account of the scheme of the Regulation, which concerns, (...) to ensure the efficient and effective functioning of cross-border insolvency proceedings through imperative coordination of the main and secondary proceedings which guarantees the primacy of the main proceedings.' By the same decision, the CJEU also held that 'insolvency must be the subject of an overall assessment in relation to the debtor's property situation as it presents

itself globally in the Member States, and not of isolated assessments, limited to the taking into account of assets located in a given territory' (Case C-116/11).

The reasoning of the European court merely confirms the rule that none of the parallel proceedings should be conducted in a manner which, although perfectly in accordance with the law of the State in which it was initiated, cannot affect either the interests of local creditors or the principle of the primacy of the main proceedings. The same principle of sincere cooperation is used in Case C-327/13 *Burgo Group SpA vs Illochroma SA*. In the articles of that decision, the CJEU held, *inter alia*, that 'the court seized of a request to open secondary proceedings must take into account, when applying national law, the objectives pursued by the possibility of initiating such a procedure', namely the fact that, apart from the protection of local interests, 'secondary proceedings may pursue different purposes'. Once such proceedings have been opened, the court 'must take into account the objectives of the main proceedings and take into account the scheme of the Regulation, respecting the principle of sincere cooperation' (Directive 2013/34/EU).

These arguments are repeated and developed in the case *ENEFI Energiahatekonysagi Nyrt vs. The Regional Directorate of Public Finance Brasov* where the Court held that "although Regulation no. 1346/2000 provides, under certain conditions, for the possibility of initiating secondary insolvency proceedings, the Court has already pointed out that the opening of such proceedings, which, under Article 3(3) of that regulation, must be winding-up proceedings, is liable to contravene the aim pursued by a main proceedings of a protective nature and that that regulation establishes, therefore, a number of mandatory coordination rules designed to ensure, as stated in Article 12, unity within the European Union' (Association Agreement btw RM and EU).

All three of the decisions were based on the provisions of Regulation (EC) No 1346/2000, but the reasoning of the European court remains unquestionably valid also in relation to the provisions of the current regulation (Regulation on insolvency proceedings 2000b).

Regulation (EU) 2015/848, in a more detailed form than Regulation (EC) No 1346/2000, establishes mechanisms to ensure the coordination of cross-border proceedings in a manner that allows all categories of interest to be protected, while the main proceedings are recognized as being accorded the predominant role in relation to any secondary proceedings. In this respect, we can mention, for example, the right of the insolvency practitioner in the main proceedings to request, in accordance with Articles 46 and 47 of the Regulation, the suspension of the process of realization of assets or the change in the nature of the secondary procedure, if the latter ensures a better consistency between the main and secondary proceedings and if the interests of local creditors are not endangered (Regulation (EC) No 1346/2000).

It may therefore be held that the relationship between the main insolvency proceedings and the secondary proceedings requires an extremely complex and subtle analysis which must simultaneously pursue both purely legal elements and the assessment of factors of an economic nature, so that the decisions taken ensure that the benefits of such proceedings are maximized.

In the light of the general considerations above, and without giving relevance to circumstances which might be circumstantial to the decisions of the judicial bodies, I could, however, identify some scenarios in which any solutions should consider the following reasons of principle:

(i) *The main bankruptcy proceedings (or similar) followed by an application to open secondary proceedings.*

In such a situation, in principle, the secondary proceedings could consist only of a procedure like the main one (with effects restricted to the debtor's assets situated in the territory of that Member State). Proceedings for reorganization/restructuring or composition are not possible, since they are incompatible with the rationale for the main proceedings, namely the liquidation of the debtor's assets and its dissolution. From that point of view, it should be borne in mind that the main insolvency proceedings concern all the assets of the debtor, irrespective of the place where they are situated. In this scenario, the nature of the secondary insolvency is imposed by a technical article (the purpose of the bankruptcy proceedings), which defeats any other article of opportunity.

(ii) *The main reorganization/restructuring or composition procedure followed by a secondary procedure*

In such a situation, it would be reasonable to consider that the secondary procedure should, at least in theory, be similar in effect to the main proceedings or, where appropriate, one with less radical effects than those of the procedure in the main proceedings. Otherwise, the secondary proceedings would constitute a major handicap for the success of the main proceedings, the purpose of which is clearly to restore the debtor's business. However, even in this scenario, it could also be imagined that the chances of reorganization of the principal business do not necessarily depend on the assets within the jurisdiction in which the opening of a secondary insolvency was requested and the interests of the local creditors could not be satisfied otherwise than by the liquidation of the assets within that jurisdiction. In this case, the secondary procedure could be one of liquidation.

(iii) *The territorial insolvency procedure itself or composition followed by the main proceedings.*

In such a scenario, the main proceedings could, in either case, be a restructuring, compositional or equivalent one, since if the creditors (together with the insolvency practitioner and obviously the court) consider that the company's activity can be safeguarded and only the assets of the State where the debtor has the center of business interests would be sufficient for this, then the

nature and effects of the territorial procedure (now secondary) should be indifferent.

A more interesting discussion arises when the territorial procedure is one of composition or equivalent and the main proceedings are inclined towards the actual insolvency or bankruptcy. In the light of the scenario analyzed above, I might be tempted to consider that symmetry should also be respected in this case as the main proceedings it cannot be of any nature other than the territorial procedure previously opened. In such a situation, we believe, the solution should consider, as a matter of priority, the principle of the dominant nature of the main insolvency. If the interests of creditors in the jurisdiction in which the center of business interests is situated can be satisfied only by the liquidation of assets, then that interest could not be sacrificed in favor of creditors of another jurisdiction in which the debtor has an establishment, or to save the debtor's business in another Community State.

Clearly, trying to capture all the possible hypotheses that may arise would be naïve. The scenarios identified above are the most predictable situations that courts can face, and the solutions that extremely schematically we have reviewed previously derive only from the interaction of general principles and rules. The complexity of economic, legal, and not least social relations will always surprise us with details for which all parties with competence in the matter will have to identify answers commensurate with all challenges and interests.

Regarding the cooperation in the field of insolvency between the Republic of Moldova and other countries, we consider it appropriate to indicate that the country's economy is relatively poorly developed, and it is required to take into account the fact that the Insolvency Law is a young one. Although we have stressed that the activity of economic agents is in a continuous development, their cross-border activity is not sufficiently consolidated to talk about insolvency (insolvency) procedures that go beyond the borders of the country and the Insolvency Law.

However, the Republic of Moldova and the European Union countries have concluded an Association Agreement, which aims to promote political association and economic integration between the parties, based on common values and close ties, including by increasing the participation of the Republic of Moldova in EU policies, programs, and agencies. Moreover, the Agreement aims to support Moldova's efforts aimed at developing its economic potential through international cooperation, as well as by bringing its legislation closer to that of the EU. Under the same Association Agreement with the European Union, the Republic of Moldova has the obligation to progressively transpose the corpus of European standards as national standards, including harmonized European standards, the voluntary use of which provides a presumption of conformity with the Union legislation transposed into the legislation of the

Republic of Moldova (Association Agreement between the Republic of Moldova and the European Union).

4. CONCLUSIONS

In conclusion, it would be important to highlight the role of the subjects in cross-border insolvency. In this article it was researched mainly the corporate insolvency in the aspect of cross-border insolvency. Also were emphasized the notions of insolvency practitioner, local creditor, foreign creditor and debtor/debtor in possession. By way of *lege ferenda*, I come across with recommendations of modification of the legal provisions of the normative act regulating the insolvency, and in particular a preferential regime of recognition of the decisions given by the insolvency court of the Republic of Moldova in relation to the assets that are in another state, a regime that would consist in their execution on the territory of the foreign state. In addition, all the assets that were owned of after their transfer to the foreign state should be liable to restitution to the insolvency administrator, and if this is not possible, then to get back their value from the debtor's patrimony, including the forced dispossession of other assets that would amount to the value of the alienated ones.

From the above, it would be efficient to infer that the Republic of Moldova, in the case of a cross-border insolvency procedure in the European area, have to consider all the European Union legislative framework in this field.

As a concluding note of the entire study, I would like to point out that the field of international insolvency has experienced an amazing evolution to this day. It was managed to demonstrate that the first accents of international cooperation in the field of insolvency have been put since the end of the nineteenth century, in a rudimentary form, through the Montevideo treaties.

Over the years, more and more countries have concluded that with the economic development, the activity of the agents crosses the limits of a single state, which leads to the imperative need to create a favorable legislative framework for insolvency proceedings, so that the interests of all creditors are protected, but also to bring a less negative effect on the debtor.

These articles envisaged led to the creation of the UNCITRAL Model Law, to the creation of the Council of Europe Regulation, the Convention of the Nordic States, etc.

Also in this context, the study in question managed to highlight that the Republic of Moldova is a beginner state in the field of cross-border insolvency, but which thanks to the Association Agreement with the European Union has all the levers to use the EU legislation in case of such a procedure. Although our country is a young one in this sensitive area of research, it is taking confident steps towards integration into the European Union, which will inevitably lead to a fruitful economic growth, and with that, the Insolvency Law will also be enriched with elements of the European *acquis*.

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IDENTIFICATION OF BANKRUPTCY RISK AND MANAGEMENT OF CRISIS COMPANIES

ANCUȚA-ANISIA CHELBA

Stefan cel Mare University

Suceava, Romania

ancutza_anisia@yahoo.com

Abstract

The purpose of the research paper is to conduct a national analysis of how the situation of insolvent companies in the period 2010-2021 in Romania has evolved. A major goal has been set in order to achieve the proposed goal. The main objective of the paper is focused on the analysis of the management of companies in crisis and the identification of companies in insolvency in Romania. The adjacent objectives are to describe the signs of crisis in society, to define the concept of crisis according to the works in the economic literature, to present the main types of crises that may affect the activity of economic entities, to describe the crisis recognition phase of an enterprise, the identification of the parties affected by the bankruptcy crisis of the company, presenting the types of analysis and methods used in the practice of prediction, defining the risk of bankruptcy, and listing the models for predicting bankruptcy. The usefulness of the study is highlighted by the importance of the results transmitted, useful results for the following categories of users: researchers in the field, academic institutions, companies looking for solutions to predict financial health and all those interested in mechanisms for assessing and forecasting the risk of bankruptcy, but also the results regarding the insolvency situation at national level in Romania.

Keywords: *insolvency; Romania; bankruptcy; companies; crisis.*

JEL Classification: A10, M40

1. INTRODUCTION

The importance of assessing the economic and financial stability of a company, as well as the need to predict the health of companies in the current economic context were the research engine of the current study. In this sense, the purpose of the research paper is to conduct a national analysis of how the situation of insolvent companies in the period 2010-2021 in Romania has evolved.

A major goal has been set to achieve the proposed goal. The main objective of the paper is focused on the analysis of the management of companies in crisis and the identification of companies in insolvency in Romania. The adjacent objectives are to describe the signs of crisis in society, to define the concept of crisis according to the works in the economic literature, to present the main types of crises that may affect the activity of economic entities, to describe the

crisis recognition phase of an enterprise. to a firm, the presentation of the types of analysis and methods used in the practice of prediction, the definition of bankruptcy risk and the enumeration of bankruptcy prediction models.

The usefulness of the study is highlighted by the importance of the results transmitted, useful results for the following categories of users: researchers in the field, academic institutions, companies looking for solutions to predict financial health and all those interested in mechanisms for assessing and forecasting the risk of bankruptcy, but also the results regarding the insolvency situation at national level in Romania.

2. LITERATURE REVIEW

The crisis is a phase in the evolution of a society marked by great difficulties, a period of tension, turmoil, trials. We can determine a signal of the crisis by evaluating the problems of the business cycle. In the literature, "business cycle analysis" has several approaches, starting with the construction of analytical theories or models and continuing with historical, statistical investigations, short-term forecasting, long-term forecasting, etc.

Crises can be social, environmental, economic, and financial. Social, environmental, economic, and financial crises are external factors in triggering and creating financial imbalances within companies (Chelba and Grosu, 2021). The problems that may occur in a social crisis are the difficulty in accessing education, the population growth, the psychoactive substance use, the labor disputes, the population growth, and others (Viziru-Stegarescu, 2018). The environmental crisis is characterized by climate change, pollution, urbanization, depletion of resources. During the economic crisis there are decreases in GDP, a decrease in liquidity, inflation, rising unemployment, political instability (Ionașcu, 2013). The financial crisis has the following consequences: demand for money higher than the supply of money, acute lack of liquidity, banks are forced to sell their investments (Mihalachi, 2012). The effects of the crisis on economic entities include late payments, financial bottlenecks, reduced sales, lack of profit, higher-than-revenue spending, inability to finance abroad, lack of liquidity, difficult access to bonuses and state aid, rising utility prices, lack of raw materials, lack of labor, need for mass layoffs (Popa, 2013).

The crisis of the enterprise represents the state in which the potential of managerial and economic viability of the company is in a decreasing dynamic, without being, however, affected the capacity to execute the due obligations. Insolvency is the state of the assets of an entrepreneur which is manifested by the inability to pay due debts. Stakeholders affected by the bankruptcy of a business are owners, manager, creditors, investors, employees, customers, suppliers, the state, auditors, and professional accountants.

The owner is considered the person most affected by the crisis of a company, as his company is in danger of going bankrupt (Chelba and Grosu,

2021). Creditors risk not being able to recover their debts, and state institutions will not receive the taxes and fees owed by the company. Current investors risk not receiving dividends, and potential investors are not attracted to investing in a company at risk of bankruptcy. Employees may be left without a number or even without a job. Customers are left without the services, the products offered by the respective bankrupt companies. The professional accountant and auditor are interested in the company respecting the principle of continuity, because for them, this principle is the foundation on which the preparation of financial reports, respectively the valuation of assets and liabilities takes place (Anghel, 2002).

Accurate forecasting of bankruptcy risk is a key factor in the competitiveness of enterprises in the dynamic environment of the international market. Assessing and assessing the financial health of an entity in the financial-accounting diagnosis requires assessing the risks that accompany its activity, some of which signal its fragility (vulnerability) and others foreshadow the bankruptcy (insolvency) that threatens its survival (permanence).

Financial health is essential for all companies, so that they can be considered in the analysis of a company's financial statements. The survival of the company is reflected in the financial statement, which describes its future financial condition which is also called continuity. Many bankruptcy cases are likely due to a lack of corporate governance, which in turn has an impact on financial difficulties (Brédart, 2014). The predicted survival of the company is very important for the internal or managerial company and the owner of the company or its shareholders to anticipate the possibility of a potential financial difficulty or financial danger. As such, financial hardship is defined as the final stage of the company's decline or as a model of early warning for financial health, which is used to predict bankruptcy or liquidate the company's problems (Sayari and Mugan, 2013).

The state of the actual financial difficulties is described as part of the two extremes, namely part of the difficulties in terms of short-term liquidity (the easiest) and insolvency (the most severe). A short-term financial difficulty is usually temporary but could become severe if there is no effort to improve. Managing short-term financial difficulties (inability to pay off maturity obligations) are not adequate conditions, potentially resolvable (the amount of debt is greater than the value of assets) and leads to bankruptcy. The financial problem is a condition in which the company's operating cash flow cannot repay its current debts, such as accounts payable or interest expenses. Financial distress is a disruption of the company's liquidity, which should be corrected by changing the size of the operation or the structure of the company.

Some authors argue that financial disaster occurs when the company has had a negative net operating profit for several years and has not paid dividends or eliminated the payment of dividends, and the company makes layoffs

(Almilia and Kristijadi, 2003). The same authors claim that the financial suffering that companies face is erased because of the net income and the book value of the negative equity in turn, as well as that the company is merging.

Over time, many authors have distinguished themselves by their representative contribution in the field of research in terms of bankruptcy risk prevention models based on the financial-accounting information of the analyzed companies. In this context, Beaver was one of the first researchers to apply statistical techniques to predict bankruptcy. According to him, the forecast is an act independent of the decision-making process, a decision cannot be called correct unless it was taken based on a forecast. Beaver's work (Beaver, 1966) became the inspiration for many applied studies that began to appear in the mid-1960s. Altman (Altman, 1968), who studied and implemented probably the most popular bankruptcy prediction model, a model widely used in empirical research, but especially in practice, applied multivariate discriminatory analysis for the first time to construct models of bankruptcy prediction. Another method, common mathematics used for food prediction, is based on logistic regression that was first applied by Ohlson (Ohlson, 1980), after also being used successfully in much research. Our work does not stop here, we will continue to discuss these models, but also other representative models in predicting the risk of bankruptcy.

Before discussing the bankruptcy forecasting models existing in the literature, it is necessary to make a brief presentation of the types of analysis and methods used in the practice of prediction. Therefore, the assessment of the risk of bankruptcy is possible by the following methods:

1. The classical method – is based on the investigation of the situation of the patrimony, on the evolution of the financial performances, the situation of the working capital and the necessary working capital or based on the financing table providing partial information on the risk of bankruptcy and generally an appreciation on a past situation (Berheci, 2009).

2. Scoring method - allows a global assessment of the risk of bankruptcy, being also a tool for predicting it (Cohen, 2004). The essence of this method consists in grouping the entities, depending on the level of risk, starting from the actual value of the financial stability indicators and the rating of each indicator expressed in points awarded following the evaluation of experts (Muntean, 2016). Depending on the type of analysis used to develop a model or a score function, the following can be identified:

- models developed based on multiple discriminant analysis (MDA) - is a statistical method that can highlight the links between a qualitative phenomenon to be explained (financial statement) and a set of quantitative explanatory elements (financial rates), (State, 2006).
- models obtained from the application of heuristic algorithms, such as neural networks - neural networks are systems that use approximation

methods based on the learning process. An important feature of these networks is that they can self-organize and thus solve problems without the need to implement programs with powerful algorithms (Prodan-Palade, 2017). Instead, they need a training phase to build knowledge, using specific data sets.

- models made through logistic regression analysis - logistic regression models the relationship between a set of independent variables (categorical, continuous) and a dichotomous dependent variable (nominal, binary). Such a dependent variable usually occurs when it belongs to two classes, categories - presence / absence, yes / no, bankruptcy / non-bankruptcy, etc.
- models elaborated with the help of the analysis of the decision trees - through the trees of choice, we proceed to the description and research of the possible variants of action, without using criteria when making decisions. In essence, a decision tree specifies the nature and consequences of assuming a possible choice (Roșca and Gâf-Deac, 2012).

In the literature and in economic practice, a series of models based on the scoring method have been developed, which can be classified according to the accounting system of the country for which they were developed in: Anglo-Saxon school, Continental-European school, and school national. The classic methods of analyzing the risk of bankruptcy used in the past are characterized by the frequent use of past financial information, information that degrades easily, to the detriment of accurate information about future events of a company. As a reaction to these shortcomings, but especially to the need to know the future, to predict the vulnerability in advance, the scoring method appeared, a method meant to optimize traditional methods.

As can be seen in Table 1, there are 13 models for predicting bankruptcy in the Anglo-Saxon school, 6 models in the continental school and 9 models in the Romanian school. All these models use the method of rates formed based on financial-accounting information from the financial reports of bankrupt, non-bankrupt or financially distressed companies. The definite signals of the appearance of the state of insufficiency of the liquidities begin the slow ruin of the activity of the company from the financial and economic point of view. This situation can be reflected in the accounting of the absence of profit, cash flow, large expenses that far exceed the income of the company, debts that exceed the short-term assets, lack of liquidity that cannot cover the debts due, so it is no longer may make overdue payments.

Table 1. National and international models for predicting the risk of bankruptcy

Anglo-Saxon school	Continental European School	Romanian school
Credit-Men or Security model - analysis	Model Yves Collongues (1976)	Mânecuță and Nicolae Model (1996)
The One-Dimensional Beaver Model (1966)	Conan & Holder Model (1979)	The Cămășoiu - Negoescu Model (1995)
The Altman Model (1968)	Model of the Central Balance Sheet of the French Bank (1984)	Model B- Băileșteanu (1998)
The Edmister Model (1972)	France Trade Credit Model (CCF)	Model I - Paul Ivonicu (1998)
The Diamond Model (1976)	Model agreed by accountants (CA Score 1987)	The Angel Model (2000)
Deakin's probabilistic model	AFDCC Model 2 (1999)	Romanian Commercial Bank Model (BCR)
The Springate Model (1978)		Model of the Romanian Development Bank - Groupe Societe Generale (BRD)
The Koh and Killough model		Raiffeisen Bank model
The Ohlson Model (1980)		Model Robu, M. A., Mironiuc, M. and Robu, I. B. (2012)
The Zavgren Model (1983)		
The Fulmer Model (1984)		
The Koh Model (1992)		
The Shirata Model (1999)		

Source: (Muntean and Solomon, 2015, p. 263)

3. RESEARCH METHODOLOGY

The research carried out is of a scientific-applied type which represents an original investigative activity to accumulate new knowledge, yet oriented, mainly, towards a specific practical purpose or objective. The literature review includes the theoretical section of the paper, and the results and discussion include the research section, i.e., the applicative part of the paper. In order to

review the literature, 19 of the most relevant papers and book chapters on "crisis" and "risk of bankruptcy" between 1966-2021 were analysed and synthesized. With the help of this literature review, the results of several representative studies on this topic were systematically identified, evaluated, synthesized and interpreted.

To carry out the research, data were collected regarding the total number of insolvent companies in Romania from 2010-2021 using Coface website. The sample consists of all companies in this situation in Romania, unlisted and unlisted on the stock exchange. The fields in which these companies have operated are diverse, including all companies in the database, regardless of whether they operate in the field of production, services or trade.

4. RESULTS AND DISCUSSION

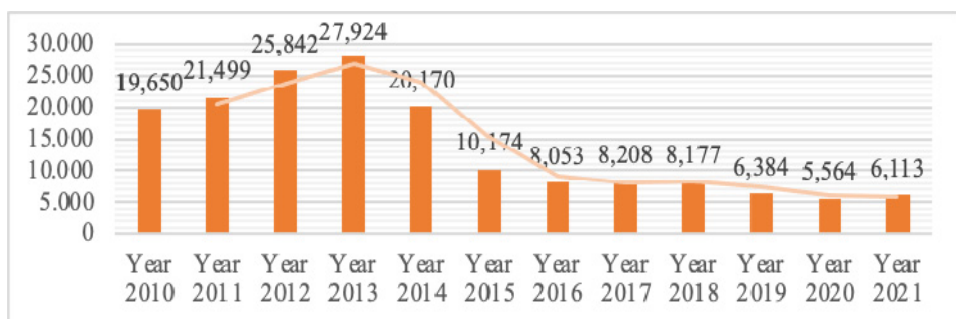
The overview of the evolution of insolvent companies in Romania starts with the assumption that most governments and companies globally have experienced unprecedented social and economic challenges because of the Covid-19 pandemic. Romania was no exception to the existence of these economic and social challenges. In the context of the restrictions against the spread of the pandemic, as well as the secondary effects propagated in the business environment, the economic results of the last two years in Romania reflect a paradox: the year 2020 was marked by a strong recession, but with few insolvent companies. followed by unprecedented economic growth during 2021, but with several companies shutting down.

Newly opened insolvencies traditionally have a minimum level each year in the summer months (July and August), due to the judicial holiday period and the reduced activity of the courts. However, in the context of the onset of the health crisis in Romania and the activation of the state of emergency at national level between March 15 and May 15, 2020, the newly opened insolvencies registered a historical minimum during this period, as can be seen in Table 2. The year 2021 marked a return to the seasonality of insolvencies, the monthly dynamics being similar to that of 2019 despite the 10% increase in the number of companies that went into insolvency during 2021, the level is still almost 4% lower than registered in 2019. Given the challenges companies face in the current economic context, the year 2022 will most likely mark an increase in insolvencies to a higher level than before the Covid-19 pandemic.

Table 2. Number of insolvent companies in Romania in the period 2010-2021

Month	Year 2010	Year 2011	Year 2012	Year 2013	Year 2014	Year 2015	Year 2016	Year 2017	Year 2018	Year 2019	Year 2020	Year 2021
January	1,897	1,709	2,159	2,101	2,091	998	705	599	737	486	404	417
February	1,903	1,840	2,420	2,441	2,201	947	731	640	734	527	457	480
March	1,887	2,160	2,560	2,368	2,211	992	801	769	863	562	352	614
April	1,506	1,847	2,340	2,690	2,059	972	769	610	670	571	35	606
May	1,544	2,097	2,396	1,945	2,118	924	712	842	783	556	463	493
June	1,880	2,127	2,343	2,310	2,173	986	754	790	775	607	760	580
July	852	811	1,322	1,517	1,151	505	396	442	467	345	801	339
August	575	658	1,007	1,050	373	328	381	544	343	253	220	263
September	2,021	2,061	2,444	2,313	1,248	928	705	943	733	636	615	610
October	1,932	2,202	2,724	4,070	1,421	962	815	873	889	695	546	548
November	2,222	2,379	2,504	2,976	1,148	887	819	614	673	648	522	628
December	1,431	1,599	1,623	2,143	1,931	745	465	542	510	498	389	535
TOTAL	19,650	21,499	25,842	27,924	20,170	10,174	8,053	8,208	8,177	6,384	5,564	6,113

Source: Coface Reports (the years 2010-2021)

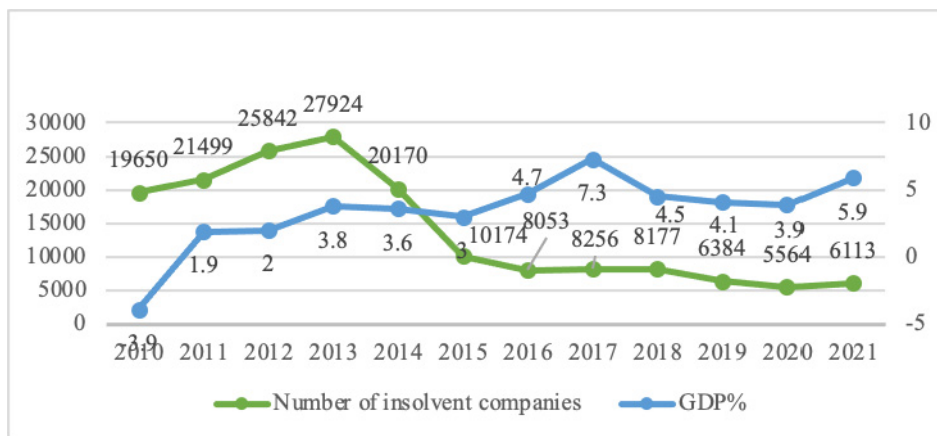
Figure 1. The evolution of the number of insolvent companies in the period 2010-2021 in Romania

Source: Coface Reports (the years 2010-2021)

The unexpected positive results of 2020 are explained by the existence of support measures offered to companies by the government in the context of the health crisis. However, the challenges for companies have increased in 2021, due to the pressure of rising wage costs, with raw materials, energy, gas, fuel or

rising interest rates. Figure 1 shows that most of the companies' insolvency situations were registered in 2010-2014, a post-crisis phenomenon related to the global crisis of 2010. There is a downward evolution of the number of bankruptcies after 2014, reaching in 2021 the value of 6,113 insolvent companies, a much higher value compared to 2020.

Figure 2. The evolution of the number of insolvent companies and the evolution of the GDP in Romania in the period 2010-2021



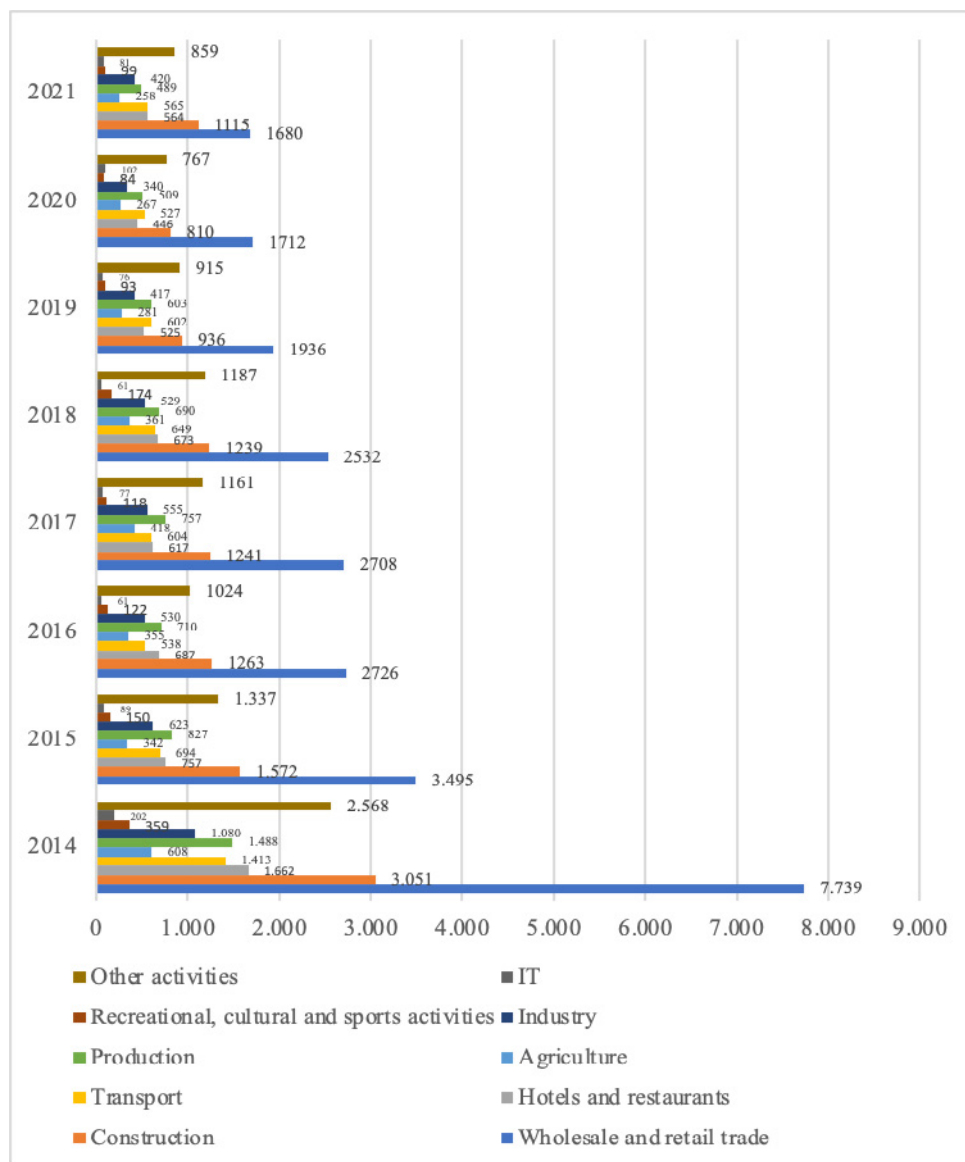
Source: own elaboration based on data from the reports of the National Institute of Statistics (the years 2010-2021) and the Coface Reports (the years 2010-2021)

Most branches of the economy contributed to the GDP growth in 2021 compared to 2020, the most important positive contributions being the following branches: wholesale and retail trade; repair of motor vehicles and motorcycles; transport and storage; hotels and restaurants; industry; information and communications; net taxes on the product. It can be seen in Figure 2 that although GDP resumed its upward trend after 2010, it failed to immediately mitigate the number of cases of involuntary growth that continued to grow until 2013. It was only after 2014 that the upward evolution of GDP in the number of registered insolvencies was felt. It is easy to see in Figure 2 that the high values of GDP have a positive influence on the number of insolvencies in Romania, as they have decreased significantly in the last 4 years.

It can be seen in Figure 3 that during the analyzed period, the first 5 sectors (trade, construction, production, hotels, restaurants) that register the largest number of insolvent companies remained largely unchanged, the only changes being at the level of order in the top, with variations of one, maximum two positions. Most insolvencies opened in 2021 were registered in the construction sector (1,115), followed by retail (847) and wholesale (833). The field of activity for hotels, restaurants and catering (HoReCa) is the category with the highest

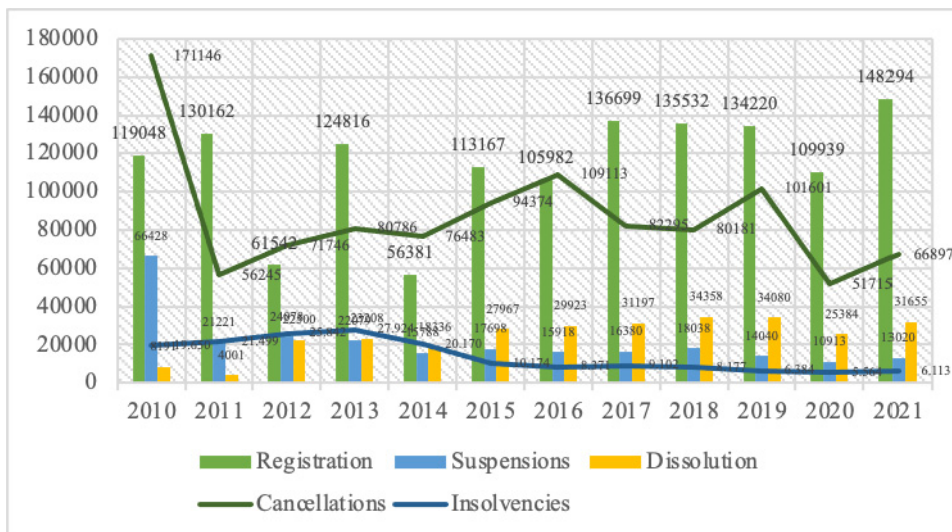
number of insolvencies, given that it was one of the most affected sectors of activity due to restrictions for social distancing in the context of the health crisis.

Figure 3. Evolution of the number of insolvent companies by fields of activity in Romania during 2014-2021



Source: own elaboration based on data from Coface Reports (the years 2014-2021)

Figure 4. Evolution of the number of newly registered, suspended, dissolved, deregistered and insolvent entities in the period 2010-2021



Source: own elaboration based on data from the Reports of the National Office of the Trade Register (the years 2010-2021) and from the Coface Reports (the years 2010-2021)

Figure 4 shows the evolution of the number of newly registered, suspended, dissolved, deregistered and insolvent entities in the period 2010-2021. Analysing the evolution for 2021, compared to the previous year, we observe a very favourable situation for the maturation of the business environment. The total number of companies set up in 2021 is close to 150,000, the highest level in the last decade. All this reflects the positive feeling of many entrepreneurs at the beginning of the road, a factor that can be fuelled by the opportunities created by the health crisis by eliminating some companies. It should be noted, however, that the number of companies that stopped operating in 2021 was increasing compared to the previous year, highlighting the negative effects of the health crisis on companies that operated in the market and were forced to cease operations.

5. CONCLUSIONS

Social, environmental, economic, and financial crises are external factors in triggering financial imbalances within companies. Referring strictly to the economic entity, it is important to point out that the crisis of a company does not mean insolvency, there is a major difference between the two concepts. The crisis of a company may be the pre-insolvency phase, but the two states do not

have an inter-conditioning relationship, with the possibility of overcoming the state of difficulty without reaching insolvency.

The help of companies was developed models for assessing and predicting the risk of bankruptcy, which experienced a significant development after the 1960s. These models are based on statistical methods that process financial-accounting information in companies' financial reports. Regarding the study of the number of insolvencies in Romania carried out in this paper, we realize that, in the short term, a huge sacrifice was made by the state, but also by economic agents, for companies to survive these difficult times. All these steps are the cornerstone for the recovery of the economy through consumption and investment. However, the health crisis leaves Romania, as well as most countries in the global economy, with a double problem: increasing debt for both governments and the business environment. What is certain is that we do not know what negative consequences this new crisis will have on companies in the near future, and even less so in the distant future.

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THE INFLUENCE OF GRAIN SILOS AND THE "BEIRUT" PHENOMENON, IN THE LOCAL AND THE EUROPEAN ECONOMY

PETRICĂ-IONEL CIOARĂ

"Ovidius" University of Constanța

Constanța, Romania

cioarapetricaionel@gmail.com

Abstract

This article proposes a new approach, considering that cereals are dangerous, even if this is not very well known. The explosion of 1.1 kilotone of cereals in the port of Beirut, caused losses of over 4 billion US dollars in real estate, death and more than 7000 of injuries, the explanation accepted worldwide being ammonium nitrate from warehouse number 12. To support my investigation, I have observed a database of photos, films and the plans of the silo, looking for answers to the basic questions in the case: why the smoke was white and why the two back cells of the silo have been destroyed, if the main explosion is the cause. My results, demonstrate that the cereals dust confined in the silo and it generated the second explosion, so there is a state of acute threat for the cities in the proximity of this type of silo, i.e. both the city of Constanța and Eforie. European Union helped with a special fund when the tragedy happened, and there is the need for special regulation to protect and to offer indemnity and insurance policies in such circumstances. The results of the research propose a new law addressing the situation.

Keywords: grains; blast; new laws; assurance.

JEL Classification: F52, G22, G28

1. INTRODUCTION

On the way of searching for wisdom and truth, the research, even if it seems metaphorical and with eschatological reverberations, seeks to demonstrate that the economic and physical concentrations of grain silos in the port of Constanța, can endanger the financial-banking stability and the health system, like the Lebanese one, looking for exit strategies, through the rational prevention.

The Lebanese Republic is a relatively small country, with an area of 10,452 square kilometers, on the eastern shore of the Mediterranean Sea, with Syria and Israel as neighbors, with a native population of about 4.5 million inhabitants, at to which are added the Syrian and Palestinian refugees, about 1.5 million people, respectively 280,000. The first 3 main cities are: Beirut, Tripoli and Zahle. (World Food Programme, 2017, p. 25). The country's Gross Domestic Product is down sharply by 2020, from 51.61 billion \$ in 2019, at 25.95 billion USD in

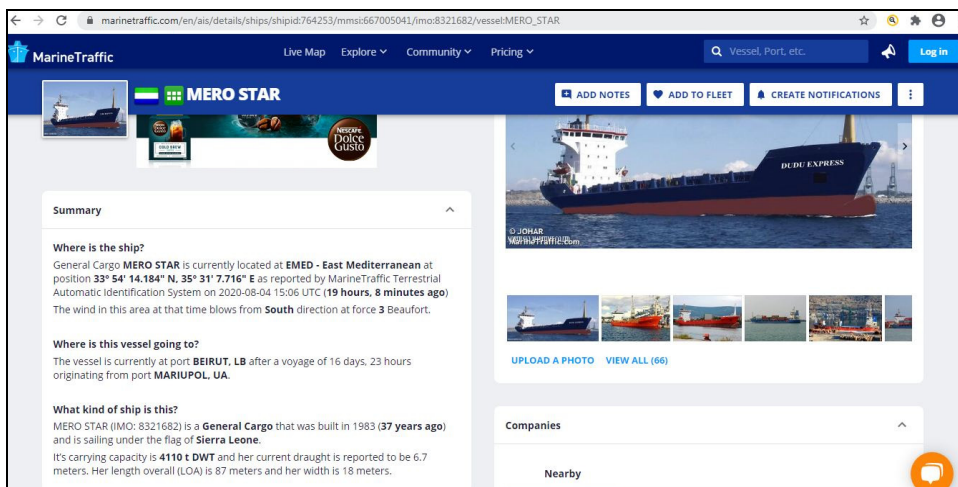
2020 and 18.08 billion USD in 2021 (The World Bank, 2022). In any case, the population of this country must be fed. In Beirut, in every street is a bank.

1.1. Problem statement of Beirut explosion

On August 4, 2020, an explosion of almost 1.1 Kilotons of equivalent trinitrotoluene (TNT) an unfortunate accident, has destroyed the grain silo in the commercial port of Beirut, due to the faulty storage in 2015, in the warehouse number 12, of the quantity of approximately 2750 metric tons of ammonium nitrate, goods confiscated as a result of the abandonment of the Moldavian flagged ship M/V Rhosus and non-payment for a long period of port charges, after a forced stop for presumed technical reasons, or possible missing charges for crossing the Suez Canal, since September 23, 2013 (Naar, 2020).

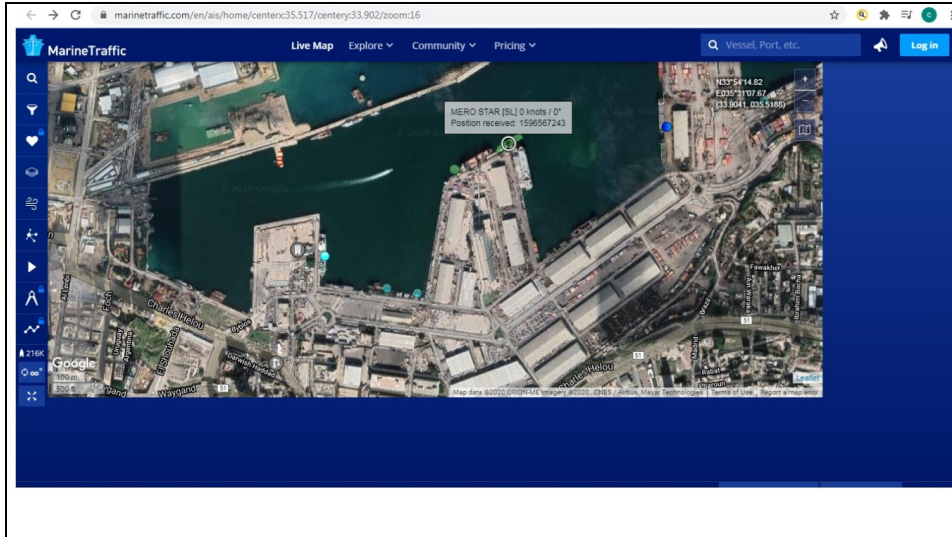
According to my research, that day 2 general cargo ships were moored for unloading in front of the cereal terminal, in berth number 8, occupying 220 meters long, as follows: M/V Mero Star (Figures 1 and 2) and M/V Raouf H (Figures 3 and 4) (Marine Traffic, 2020).

Figure 1. The geographical coordinates of M / N Mero Star in berth no. 8, Beirut

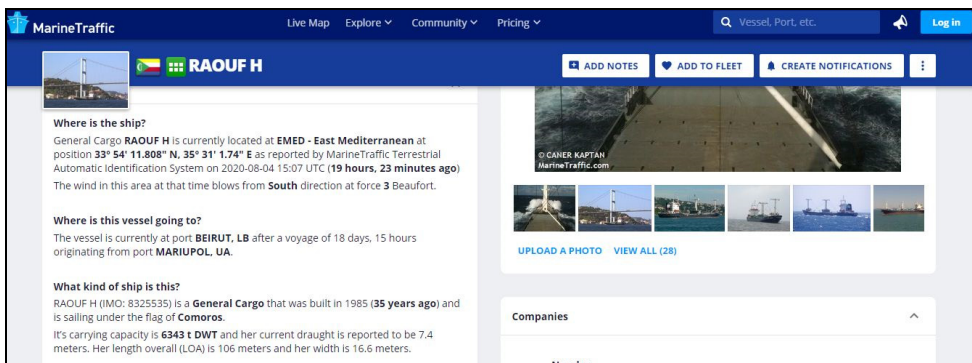


Source: author's capture from Marine Traffic (2020)

The cereal terminal in the port of Beirut has a capacity of 120,000 metric tons and it was built in 1960s, by a controversial banker Yousef Beidas. It is the warehouse of the national reserve, funded by the Kuwait Fund for Arab Economic Development, the deposit capability being the reserve to cover the necessary for about three months for the whole country consumption (Oweis, 2020).

Figure 2. The port position of M/V Mero Star in berth no. 8, Beirut

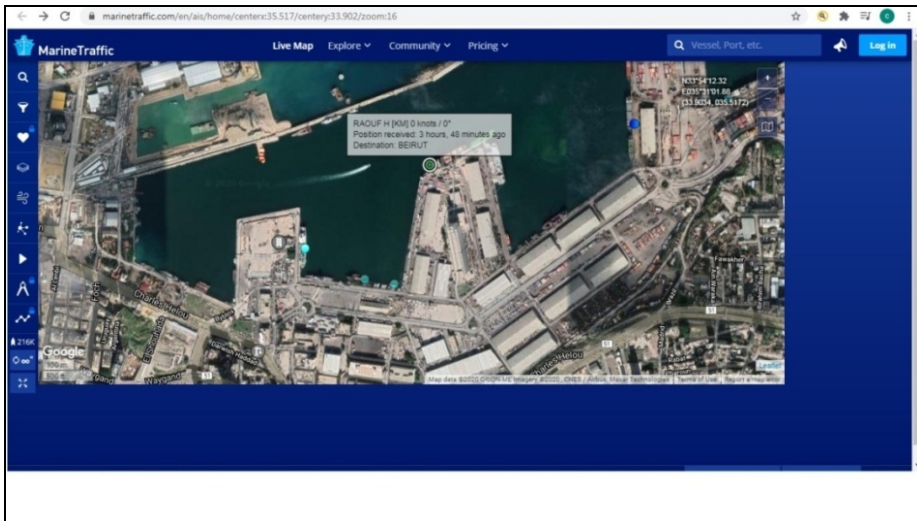
Source: author's capture from Marine Traffic (2020)

Figure 3. Geographical coordinates M/V Raouf H in berth no. 8, Beirut

Source: author's capture from Marine Traffic (2020)

1.2. State initial hypothesis; are ports dangerous?

This research, began as a result of the questioning the possibility of the subjective-procustian approach to "stretch" the conclusions, in order to agree with the simplicity of the first ideas regarding the disaster. The simplest would be to assume that the explosion was caused by ammonium nitrate, a globally accepted assumption at this time. In Romanian harbours, we have a lot of grain silos and deposits. The initial hypothesis is that grains explode.

Figure 4. The port position of M/V Raouf H in berth no. 8, Beirut

Source: author's capture from Marine Traffic (2020)

1.3. Literature review of Beirut explosion

After researching the level of knowledge about the explosion of cereals, we found that in the eighteenth century, more precisely in 1795, in Italy, Count Morozzo described the first explosion of cereal dust from a bakery in Turin. (Russell, 2016, p. 3). In 1976, there were 16 large explosions of grain silos in the United States, resulting in 19 dead and 82 wounded, the largest disaster being recorded in 1977. In April 1988, the Joliet Illinois silo was considered a total loss by insurance companies. Serious explosions have also taken place in: Russia, Germany, Morocco, Spain, Argentina, Japan and Canada. In 1970, 77% of the explosions were caused by grain elevators, but not only. All deposits were located outside the cities at safe distances. There are 7 elements needed in order that an explosion occurs: the presence of oxygen to sustain combustion, fuel source, in our case cereal dust, the mixture of the fuel source in the air, a minimum concentration, a source of ignition, the grain dust to be dry and an enclosed space (Russell, 2016, p. 27). There are four known stages of the combustion process of the grain dust: moisture and evaporation (between 50–151 Celsius degrees), pyrolysis and combustion of hemicellulose (between 151–239 Celsius degrees), pyrolysis and combustion of cellulose (between 239–335 Celsius degrees), as well as pyrolysis and combustion of lignin (starting with 335 Celsius degrees, up to more than 2000) (JiangPing *et al.*, 2020). The violent burn of the grain dust is generating enormous pressure in confined spaces, so not the grains, but grain dust does explode.

This article wants to open another way of understanding the Beirut affair, the novelty being the grain dust combustion, based on the evaluation of the

dynamic of the event (Yu *et al.*, 2021). The effect of the explosion on the grain silo, based on the calculations, pointed out 220 tons of TNT, 564 tons of Ammonium Nitrate equivalence, 20.5% of the total 2750 tons stored in the berth number 8 (Temsah, Jahami and Aouad, 2021). Yet, the experimental approximations with calculations are not checked.

1.4. Economical quantifications of Beirut destruction

Physical damage is estimated at US \$ 3.8 - 4.6 billion, the most affected being neighborhood homes (The World Bank, 2020, p. 23). The losses in the economic circuits are about 2.9 - 3.5 billion US \$, the most affected sectors being the ports, the transports and the culture (The World Bank, 2020, p. 23). The priority for recovery and reconstruction requires 1.8 - 2.2 billion US \$, for transportation, culture and housing (The World Bank, 2020 p. 23). The following impact on the Lebanese economy in 2021 was estimated: losses in the economy between 0.4 - 0.6% of G.D.P. in 2021 (please insert a comment on whether this estimation was validated or not), imports will contract by about 0.4 - 1.3%, rising inflation (The World Bank, 2020, p. 23).

1.5. Information about the port of Constanta; E.U HELP

According to the statistics of the Maritime Ports Administration Constanța, grain silos amount to approximately 1,800,000 metric tons, are ten times bigger than the capacity of the Lebanese silo (Constanta Port, 2022). Competition, routine, low costs, low wages of workers and other factors, lead to events such as the explosion of the Petromidia Năvodari refinery, of July 2, 2021 (Tobias, 2021). The ships Mero Star and Raouf H, are a total loss, as a result of 1.04 tons of TNT equivalent explosion (Equasis, 2022). In the response of the Beirut disaster, the European Union supported with a total of € 170 millions and started the Reform, Recovery and Reconstruction Framework, with United Nations and World Bank (European Parliament, 2022, p. 11).

2. RESEARCH QUESTIONS; AIMS OF THE RESEARCH

In 2020, after one year of global pandemic situation of SARS COV 2 - Covid 19, the destruction of the warehouse of the national grain reserve is an equally great disaster. Understanding the accident causality will prevent future incidents and huge losses in other parts of the world, including Romania. The first hypothesis addressing the causality is that the grain silo was a huge bomb and the additional questions are why was there a third explosion and why are there two silo cells destroyed in the back. Also, the line of investigation could develop with the dilemmas why have other cells remained untouched and what were the precise losses generated by the event. After determining these initial answers, other could be addressed, such as what are the funds needed for

reconstruction and if and how the How European Union could help in such a tragedy.

2.1. Methodology

We will use the method of inductive research from the individual to the general, using the qualitative and quantitative research, based on public information sources in the online environment (Mill, 2011, pp. 616-871). We will create the database by collecting relevant all information from online sources, related to the characteristics of the Beirut silo, dynamic of the incident, particularities of the deposit and possible lack of prevention, available in media communication for public, photos and screenshots from relevant videos about the event. We will process the respective data, drawing the possible steps to validate the main hypothesis of the research, to identify similar threats/sources of explosion in the port of Constanța, estimating the consequences of possible incidents for Constanța County and identification of possible solutions to prevent and, if needed, to recover after such a tragic incident.

We mark with the letters A, B, C, the three rows of cells of the silo, starting with A of those from the berth (East). We will mark with numbers from 1 to 16, from South to North. We identify six important moments of the incident. We establish some levels of destruction and colors of representation in the plan: intact (dark green), partially destroyed only at the top (light green), totally destroyed only at the top (pink, or gray), completely destroyed (black, or red). We calculate the percentage of total destruction and we consider that the first row of silo cells was punctured by the first explosion. The solid cells are intact, the open ones can be filled with grain dust once they are loaded, the closed ones are partially filled, some of the energy is consumed with the destruction of the access mouth in the cells. We will use the method of Zalosh (DiNenno *et al.*, 2002, pp. 1-86) to calculate the force of the blast, and for the pressure rise of the confined explosion, using the following formulas (United States Nuclear Regulatory Commission, 2022):

$$P_{max.} = \left(\frac{T_{ad}}{T_a} \right) P_a \quad (1)$$

Where:

$P_{max.}$ = maximum pressure developed by the completion of combustion (KPa);

P_a = initial atmospheric pressure (KPa);

T_{ad} = adiabatic flame temperature (K).

For the blast wave energy calculation, we will use the formula:

$$E = \alpha \Delta H_c m_F \quad (2)$$

Where:

E = blast wave energy (KJ), [E is the Trinitrotoluene (TNT) equivalent energy];
 α = yield (is the fraction of available combustion energy participating in the blast wave generation);

ΔH_c = heat of combustion (KJ/Kg);

m_F = mass of flammable vapor release (Kg).

For the TNT Mass equivalent calculation, we will use the formula:

$$W_{TNT} = E / 4500 \quad (3)$$

Where:

W_{TNT} = weight of TNT (Kg);

E = explosive energy release (KJ).

I will use a personal very simple formula, to estimate possible damages of the real estate, in the Constanta County:

$$\Delta D_{Total\ Constanta} = [(n_{Rooms} \times Q) \times i\%] \quad (4)$$

Where:

$\Delta D_{Total\ Constanta}$ = Total Damages for Real Estate in Constanta;

n_{Rooms} = number of rooms, considered with one window;

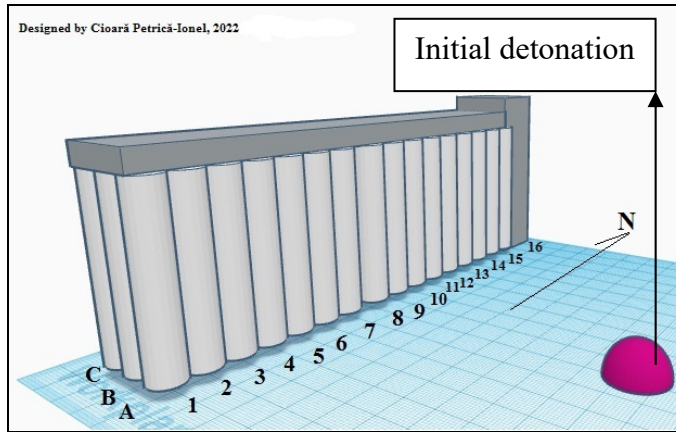
Q = the estimated cost of a new window;

$i\%$ = inflation for a special situation, like the Beirutian one.

2.2. Database of Beirut explosion research

The grain silo, represented in Figure 5, contains two bodies with three sections of 8 cylindrical cells, with an inner diameter of 8.5 meters and a height of 50 meters, built in two different periods and separated by a space of 1.2 meters (Temsah, Jahami and Aouad, 2021).

Figure 5. The port grain silo of Beirut



Source: author's design

The identification of the six important stages of the explosion is done by studying representative images: the port grain silo of Beirut, smoke; the port grain silo of Beirut, light the port grain silo of Beirut, fireball; the port grain silo of Beirut, grain dust; the port grain silo of Beirut, grain dust detonation; the port grain silo of Beirut, grain dust shock wave. It is important to observe the grain dust in the photograph (Figures 6 and 7).

Figure 6. The port grain silo of Beirut, grain dust



Source: author's capture from Global News (2020)

Figure 7. The port grain silo of Beirut, grain dust detonation

Source: author's capture from Global News (2020)

I graded with numbers from 1 to 10, 1 means 10% and 10 means 100%, and I estimated using the photography of the silo after the blast (Hubbard and Habib-Abi, 2020).

Table 1. Destruction % of the Beirut Silo at 4 of August, 2020

Column Row	Column of the Silo Cells																
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	---
C	9	8	1	0	0	1	1	1	1	0	0	0	0	0	0	1	8
B	10	10	0	0	0	1	2	2	2	10	0	10	10	10	10	10	3
A	10	10	0	0	10	10	10	10	10	10	10	10	10	10	10	10	2
Total General 13 th of zero, means 13 th silo cells full of grains that survived after the blast.																	13

Source: author's estimation

After the blast, 13 silo cells remained untouched and full of grains (Table 1). Some cylinders remained full of grains, while other cells of the silo were partially destroyed.

This means a total of 27.83% of all, 33,396 tons out of the 120,000 tons, precisely 72.17% of explosive dust. Considering the minimum of humidity of 1 %, 10 times less than in the quality standards, this means 33,396 tons x 1000 Kg of $m_F = 333,960$ mass of flammable vapor release (Kgs). The T_{ad} is estimated at 600 Celsius degrees, and $T_a = 45$ Celsius degrees. For confined spaces the Yield (α) is 100 %. ΔH_c is considered to be 14,121.0 (KJ/Kg). Initial Atmospheric pressure (P_a) is considered to be $P_a = 101.35$ KPa (Al-Mahasneh *et al.*, 2008).

2.3. Results and discussions of Beirut explosion

Applying the formula (1), it results that:

$$P_{\max.} = \left(\frac{600^{\circ}\text{C}}{40^{\circ}\text{C}} \right) 101.35 \text{ KPa} \quad (1)$$

$$P_{\max.} = 1520.25 \text{ KPa}$$

Applying the formula (2), it results that:

$$E = \alpha \Delta H_c m_F = 100 \% \times 14,121.0 \text{ (KJ/Kg)} \times 333,960 \text{ Kgs} \quad (2)$$

$$E = 4715849160.00 \text{ KJ}$$

Applying the formula (3), it results that:

$$W_{\text{TNT}} = E / 4500 = 4715849160.00 \text{ KJ} / 4500 \quad (3)$$

$$W_{\text{TNT in Kgs}} = 1,047,966.48 \text{ Kg} / 1000$$

$$W_{\text{TNT in tons}} = 1047.96648 / 1000 \text{ tons of TNT equivalent}$$

$$W_{\text{TNT in Kilotons}} = 1.0477 \text{ Kilotons of TNT equivalent.}$$

2.4. Estimations of possible damages of the real estate in Constanta county

$$\Delta D_{\text{Total Constanta}} = [(844099 \text{ Rooms} \times 100 \text{ €}) \times 150\%] \quad (4)$$

$$\Delta D_{\text{Total Constanta}} = 126,614,850 \text{ €}$$

$n_{\text{Rooms}} = 844,099$ rooms, considered with one standard window; (INSSE Constanta, 2018)

$Q = 100 \text{ €}$ / standard window

$i\% = 150 \%$ inflation for a special situation, like the Beirutian one

2.5. Interpretations of the results

As can be seen, the pressure in the grain silo at the time of the explosion was 1500 times greater, than atmospheric pressure. The resulting energy (E) is approximately 4.7 billion KJ, the amount of Trinitrotoluene equivalent explosive approaching 1.047 Kilotons, just for 1% of water moisture, knowing that the European Union standard provides a value of 12%, 12 times higher (Commission of the European Communities, 1996). The hypothesis that the explosion was caused by grain dust is confirmed, possibly with a higher energy.

The initial estimates of the destruction of cultural objectives, difficult to quantify due to the uniqueness of those in transport and real estate, the last perhaps the most important, being the shelter of a large community, were minimized in order not to create panic. However, the differences are enormous. So, total Inflation for Food and non-alcoholic beverages between:

- December 2018 - October 2021, reached the incredible 2067%;

- December 2019 - October 2021, 1874% (Lebanese Central Administration of Statistics, 2021).

Imports, in 2020, decreased from 19239 million dollars in 2019, to 11310 million dollars, by 7766 million dollars, with less than 31.34 %, almost the same as the decrease of Lebanese GDP (Lebanese Chamber of Commerce and Agriculture, 2020).

3. CONCLUSIONS

The hypothesis of grain dust blast is confirmed. The cities of Eforie and Constanța are directly endangered, because there are no natural obstacles in front of the shock wave of a possible explosion, it is necessary that the grain terminals insurance policies to change, for important local damages, and macroeconomic changes in the Romanian and the European economy.

I propose a new law, relocating the silos along the Danube-Black Sea Canals, changes in the I.S.P.S. rules and new special courses for all the peoples implicated in the portuary operations. I propose a short scale blast experiment, with state authorization, simulating the Beirut blast and a local possible scenario, too.

LAW PROJECT PROTECTION OF CITIES AGAINST THE GRAIN EXPLOSIONS

Reason

This law has the role of protecting the population against events similar to the explosion in the port of Beirut, from August 4, 2020.

Article 1

This law applies to all natural and legal persons, who carry out their activity on the territory of the Republic of Romania.

Article 2

All grain storage systems situated at a distance of less than „hhhhh” meters from the populated areas, are obliged to have an insurance policy, up to the total amount of “nnnnn” leis, to compensate the owners from the neighboring areas, in case of disaster.

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LEGAL FRAMEWORK AND TRENDS OF THE DIGITAL BANKING AGREEMENT

VIOLETA COJOCARU

*Moldova State University
Chişinău, Moldova
violetacojocar@yahoo.fr*

ALIONA CARA-RUSNAC

*Moldova State University
Chişinău, Moldova
caraaliona2019@gmail.com*

Abstract

The article will analyze the legal framework and trends of the Moldovan digital banking agreements and its impact on banking activity overall. There will be presented the Moldovan digital banking agreements that were implemented in the banking activity area and their impact on the increase of clients desire to sign these types of contracts. Banks were first in row to explore the digital area as consequences of the technological progress and by simplifying clients' needs to access faster banking service activities. The business of the companies in special banks is based 80% on contracts. Despite this fact, the digital banking contract involves security issues that clients might incur connected to theft of the identity, validity of electronic signature, access to internet in rural areas, and the classic banking transactions such as loan approvals, account opening and investments have not experienced the digital revolution switch due to the consumers' strict legal requirements. Nevertheless, it will be presented the role of the National Bank of Moldova in adopting legal framework necessary for developing digital banking contracts and the resistance of the other players of the banking digital market as payment providers.

It will be argued that there is a need to tackle solutions to banks challenges at the European, International level that the national level, and will be considered the role of the International, European and national monitoring institutions to provide appropriate solutions and if necessary to adopt restrictions in cross-border banking digital services and the risks that clients might experience by accessing those services. Finally, the authors will compare the trends of the Moldovan digital banking contracts compare to the digital banking contracts in European Union area and will come up with solutions how to integrate Moldovan Banking activity in European Union standards.

Keywords: *digital contract; digital banking; banking digital contract; clients' rights; banking European regulation on digital agreements; Moldovan banking activity; digital platforms; EU banking and payments sector; pandemic crises.*

JEL Classification: P37

1. INTRODUCTION

The banking services are key priority for persons' needs, ever for natural persons and/or for legal entity. People need digital banking services, as it offers faster and cheaper services. Lately banking and technology are changing faster than ever.

In order to survive business on the market digitalization in our days is inevitable in services that has to be provided to clients, the banking business also has to be digitalized in order to face the challenges of the health crisis, pandemic crisis, security crisis and other crises that catalyzed the number of online transactions and the diversification of the services offered by the banks.

In this article the authors will present the digitalization of the banks and the trends of developing of the legal framework of digitalization of the banks and moreover of the banking digital contracts framework, as the relations between the banks and the clients have to be formalized ever in classic form by signing the contracts ever by distance or by digitalized form by using the electronic means, platform and/or other distant forms of signing the contract or by expressing the will to access the services and the products offered by the banks.

2. DIGITALIZATION OF BANKS: TRENDS AND LEGAL FRAMEWORK

A fairly new and modern phenomenon for the Republic of Moldova is the legal act in electronic form. Digitization, which represents a process of automation of different services, transformation and conversion of different information and versions on paper, in online format. It is a process that is developing more and more actively, so there is a need to adapt the legislation to the level of the digital economy. At the level of international organizations, there is already a series of strategies, but neither in theory nor in practice is it based on the legal regulation of this sector.

However, the Civil Code of the Republic of Moldova in art. 318 para. 1 mentions the fact that: "...the legal act has an electronic form if it is included in an electronic document that meets the conditions of the law...", and para. 2, "...the legal act in electronic form is equivalent to the legal act in written form if it bears the electronic signature of any type provided by law of the person concluding the act". Following the modernization of the Civil Code, it was also mentioned the increase of regulation of the documents in electronic form. Likewise, in Law no. 91 of 27.06.2014, regarding the electronic signature and the electronic document, the electronic document is defined as "*information in electronic form, created, structured, processed, stored and/or transmitted through the computer or other electronic devices, signed with the electronic signature in accordance with this law*". Another definition of electronic contracts is regulated in Law no. 284 of 22.07.2014, regarding electronic commerce, art 4(B), in which the electronic contract is defined as: "*the totality of*

the electronic documents that constitute the civil law contract, aiming at the establishment, modification or termination of civil rights and obligations, the object of which may be goods, the works or services". Last but not least, art. 1013 of the Civil Code, defines the distance contract as: "...any contract negotiated and concluded between the professional and the consumer within the framework of an organized distance sales or service provision system, without the simultaneous physical presence of the professional and the consumer, with the exclusive use of one or more means of distance communication, until and at the time when the contract is concluded, including any order made by the consumer that produces binding effects on him". According to the Directive 2000/31/EC for the creation of the legal framework that would facilitate the conclusion of contracts in electronic format, this and other international sources are the ones that become a very important support in the development and harmonization of national legislation in this field of contract digitalization. For example, the given directive mentions that any contract can be concluded in electronic form, but member states are allowed to exclude certain contracts from this rule, such as contracts relating to real estate, contracts involving notaries public or public authorities, inheritance etc.

At the international level, a series of conventions, directives were elaborated that would come as a help to all countries. One of the Conventions is the New York Convention of 2005, a convention that aims to facilitate the use of electronic contracts in international trade by ensuring that contracts concluded electronically are as valid and enforceable as their traditional paper equivalents. These conventions aim to strengthen the harmonization of rules on electronic commerce and promote uniformity in domestic adoption, as well as to strengthen and supplement certain provisions in the light of practice (United Nations, 2005). And the countries that still do not have a well-established regulation to adopt the internal legislation on electronic commerce, to international standards, thus creating a modern, uniform and thoroughly elaborated legislation. Not least the importance of the electronic signature, which the eIDAS Regulation defines as "data in electronic form that is attached or logically associated with other data in electronic form and that is used by the signatory for the sign". According to eIDAS, electronic signatures can be classified as 'simple', 'advanced' or 'qualified'. This complex designation hides a much simpler reality - most users may not realize they are 'signing' electronic contracts. By ticking 'Accept' or 'submit' in online purchases, signing their name at the end of an email, or the use of biometric signatures (fingerprint and facial recognition). The National Bank of Moldova is trying to harmonize the banking legislative framework in order to implement the provisions of the Payment services (PSD 2) – Directive (EU) 2015/2366 having the goal to accelerate the innovative development of the banks and to create the necessary legal environment in order to give the opportunity to

modernize the services and products offered to the clients (natural persons and/or legal entities).

Mr. Gîrlea M., the author of the research *Digitalization of banking financial institutions a determined factor for the development of the business banking models*, stated that 30% of the traditional banks' income is out of the products designed for personal needs credits and payment operations. The bank's financial situation is tightly connected to the macroeconomic indicators and in particular by the financial crisis that starting last decade became a normal event as: the crisis from 2007-2008 with the collapse of the Lehman and Brothers banks, the crisis of the European sovereign states that started in 2010, these two events has shown the fragility of the world financial system and the structural problems that existed within the system. As a consequence of the described events the Governments from Europe and United States had adopted measures to stabilize the financial situation of the banks such as: requirements for equity increased significantly and most probable will increase accordingly. The supplementary taxes in some countries and the burden of costs added an additional pressure on the profitability of the banking sector. The banks are struggling by attracting client via low interests, or zero commissions for some services. Nether the less the income of the banks is really unstable as the fidelity of the clients became lower and lower (Gîrlea, 2020, p. 366).

Digitalization of the banks in the context of constant crises is inevitable, the pandemic crisis catalyzed the number of services and contracts in online sphere.

Digital banking is a new category in the bench of innovations. NYMBUS drafted a list of digital banking based on the criteria in Table 1.

NYMBUS considers that in order to be included in the list of digital banks, it shall be actively provided at least one of the services directly to consumers, legal entities or both, included above: digital banking, digital payments, digital lending, investment services/solutions. In the list were included banks from around the world, including UK, Belgium, Ireland, India, China, Nigeria, Brazil, Canada and other countries. The expert analysts stated that NuBank based in Brazil is the largest digital bank by valuation, Chime is the biggest digital bank in US (over 13.1 million digital bank users) and Revolut based in London is the biggest digital bank in the UK having more than 19,130,000 million users (The Financial Brand, 2022). It was mentioned the importance to take into account the above-mentioned indicators in order to be qualified as a digitized bank, thus as a modern bank that offers new services and products. The banks from the Republic of Moldova also applies the above-mentioned indicators, indeed it is still present a gap and some services and products have to be developed in order to qualify as a digitized and innovative bank.

Table 1. NYMBUS digital banking criteria

Category	Criteria
Digital Banking	Providing the same (or similar) transactional functionality as a checking account. Service intends to replace or compete with checking accounts offered by traditional banks and credit unions.
Payments	Facilitating payments and/or money transfers between parties (e.g., Venmo, Zelle, PayPal).
Lending	Providers offering loans and/or lines of credit.
Investments	Platforms that allow investors to trade equities, bonds and other standard retail investments, or services that help investors research and analyze such trades. Does not include currency, crypto or forex.
PFM Tools	Facilitates the analysis of spending patterns, classifying/categorizing expenses, building budgets, and/or aggregating accounts from multiple third-parties.
Financial Education	Tools that help consumers build their financial knowledge and/or skills. Includes credit repair, credit monitoring, and credit building services.

Source: (The Financial Brand, 2022)

According to the research made by the Beterna Banking, *How data can impact banking services in 2022-2025*, four key areas where data can add value in the financial services sector: 1) customer intelligence – data can be acquired through the new technologies, mobile apps, social media, GPS movements (if the customer gives the consent) of the customer and respectively used to attract the client through their apps (for example as the client is a shopping addicted you can offer loans whenever it is needed); 2) reimagine business processes, it implies the correct usage of the data hold by the bank, in some areas it is necessary to boost it, and to use it in the right way or are not presenting to the right person, so to use the data in the right way and to have the right business intelligence tools; 3) new business opportunities, it relies on the data analyses of the clients behavior on the website and also of the third party data, so for example exploring the amount of the deposit of the client and the level of purchasing on a specific geographical region, researching other potential data that might open business opportunities and the last one 4) risk management that actually occupies the first place in many banks, that is the challenges of analyses of the spotting fraudulent transactions. Nerveless, three strategic area that need to be assessed and improved by technologies according to the conclusions given by McKinsey and will have a huge impact on the financial business is modern

cloud integration tools. Modernization of the technologies involves many risks out of which the security of the data transmitted by the clients, data protection and data processing, thus the modern cloud integration tools and data gathering has to be committed carefully and *“proactively gathering data in a reusable repository, while maintaining high data and data governance”*, this aspect gets a high interests as from the bank’s side as from the governmental authorities as the control body of the regulatory and protection of the consumers ‘rights. Self-service analytics & data literacy is another important strategic domain for bank that needs attention as the customers tend to use the services by them self and in this way, they have to be literally educated by the bank how to use the data offered by the bank or by the bank’s platforms through *“data literacy programs”* and the artificial intelligence that plays a crucial role in digitalization of the banks and in everyday business. The name and the popularization of the cloud technology and development of the AI Integrations in everyday tools have leaded many companies to implement new technologies in smart segmentation, personalized offers, chum prediction, early credit repayment simulations etc. (Be-terna banking, 2022).

According to the EU ranking data - 54% of the European Union habitants aged between 16 and 74 years old had in 2021 at least basic digital skills, however Romania is situated on the last place in the EU ranking as only 28% of the persons aged 16 and 74 years old had basic digital skills, according to the Eurostat data from March 2022. Finland and Netherlands are ranked in top list among EU countries, in the conditions in which 79% of the persons aged 16 and 74 years old of the two states had at least basic digital skills, at the opposite pole are Poland (43%), Bulgaria (31%) and Romania (28%). In March 2021, the European Commission presented its vision and prospects for the digital transformation of Europe by 2030. The Commission proposed a guide (compass) for the digital dimension of the EU, which includes four strategic directions: skills, secure and sustainable digital infrastructure, and the digital transformation of enterprises and the digitalization of public services. In terms of skills, the digital compass requires at least 80% of the population have at least basic digital skills by 2030 (Omniapres, 2022).

In the first trimester of the 2022 year, the banking sector was characterized by high liquidity and an increase in loans and equity. According to the data presented by the National Bank of Moldova (NBM), the profit for the year compared to the same period of the previous year increased, mainly due to the increase in interest income and non-interest income. At the same time, expired loans decreased both in absolute value and as a share in total loans.

The reference period was marked by risks and uncertainties generated by the pandemic crisis, which later overlapped with those triggered by the war in Ukraine. As a result, there was a decrease in assets, deposits of individuals and legal entities, as well as deposits of banks. At the same time, the balance of non-

performing loans increased, affecting the quality indicator of the loan portfolio compared to the end of the previous year. However, the regulator indicates the banks were facing challenges as the pandemic crisis and the security crisis led to the instability in the financial-banking sector (Omniapres, 2022).

The situation starting February 24th, 2022, the day of the beginning of the Ukrainian – Russian military conflict, in the Republic of Moldova brought chaos within the clients, on one hand the clients of the banks (citizens and residents of the Republic of Moldova) were withdrawing the deposits. On the other hand, the Ukrainians were depositing money or also withdrawing the money that they transferred from Ukraine or from other countries and were carrying them to the destination countries. In some aspects, were legalization of the money carried by the Ukrainians as the banks smoothed the requirements on anti-money laundering and accepted the money declared and deposited by the Ukrainians.

As of March 31, 2022, 11 banks licensed by the National Bank of Moldova were active in the Republic of Moldova. A bank was supervised under the early intervention regime applied at the beginning of 2019. Subsequently, by the decisions of the NBM Executive Committee, the period for appointing temporary administrators was extended until October 28, 2022.

The structure of the shareholders of most of the banks from the Republic of Moldova consists of foreign investors. Thus, in some banks they detain 98.26% as for example in OTP Bank the main shareholder is the OTP Bank NYRT, Hungary, the other bank is MAIB bank (41.09% is owned by the investment consortium HEIM Partners formed from European Bank for Reconstruction and Development, Horizon Capital and Invalda INVL), Victoriabank where the majority of the shareholders are held by the VB Investment Holding BV (72.19%).

During the first quarter of 2022, AS IuteCredit Europe (Estonia) acquired the treasury shares of B.C. Energbank S.A. in the amount of 49.42%. Subsequently, through the Moldovan Stock Exchange and within the public offer, it acquired the shares from several shareholders of B.C. Energbank S.A. Thus, currently, the company AS IuteCredit Europe holds 94.58% of the bank's share capital (Bizlaw, 2022b). Taking into account the above mentioned the banking system from the Republic of Moldova is quite influenced by the politics of their foreign shareholders and the possibilities increases the chances to get digitalized services. It was observed a trend of the banks to modernize their services and products and to offer more products in online medium as the target to attract new clients. However, taking into account the financial culture of the clients from the Republic of Moldova the classic banking system will be present for a longer period.

As Mr. Girlea stated in his research the digitalization of the banking system in the Republic of Moldova is at the incipient stage, this is an advantage for the banking activity, as the banks might analyze deeply the possibility to implement

new technologies in their services, based on the past experience of other financial institutions from abroad taking into account the specific of the national economy, in tight correlation with the economic, cultural and social realities, and the national requests of the clients and the specific of the country. On the other hand, this restraint in adoption and promotion of the innovative services and products, respectively optimization of the production processes, might affect the competition capacity of the domestic banks, making them weaker in comparison to other financial institutions that intermediate directly in the Republic of Moldova (Gîrlea, 2020, p. 367).

The new trend in developing digitalization of the banking activity is oriented through minimum three directions: banking platforms, digital banks and OEM banks (Original Equipment Manufacturer). The first model represents the platforms offered by banks via fintech and other competitors in order to access the banks products and services. The second model the digital banks, these banks are distinguished by the extended variety of services also by the processes from front and back-office. The digitalization is a key element because banks compete against agile and disruptive business models. However, the traditional banks increased their digital offers, but the digitalization requires an integral reformation of the banks, the traditional banks are developing some of their IT systems or adapt new technologies to the existed ones and this does not always seem to work, this makes more difficult the adaptation to the new technologies. The last model is the original equipment manufacturer, the OEM banks are contracting external suppliers in order to cover some services. For example, the suppliers might be integrated in order to maintain daily the loans, thus it might be integrated in the back office and middle office, leaving to the banks the services that really differentiate them from their competitors. As the authors mentioned the costs of the banks by this model might be reduced up to 40%, that makes it so attractive compared to other models presented above (Gîrlea, 2020, p. 371).

In Republic of Moldova the banks are also trying to externalize some services as for example accounting services, in particular the relations related to salaries as it is considered with confidential title, the debt collection usually it is also externalized, IT system maintenance and update it might be also externalized. The digitalization is partially implemented and regulated by the Law on payment services and electronic money no 114 from 18.05.2012. However, it is still requiring a deep analyzes and modernization of the legal framework in the field of digitalization of the financial-banking sector.

The Moldovan banking regulator National Bank of Moldova (NBM) is developing the legal framework in order to harmonize the legislation to the international and European standards in the field of banking digitalization. At the international conference *Digital Transformation and Financial Inclusion*, the Governor of the NBM – Mr. Octavian Armașu mentioned that the Republic of

Moldova has no other solution than to embrace a course of innovations. Additionally, his Excellence the Governor mentioned that these two priorities are also on the strategic list of the central bank as well as of the banks. The two crises: pandemic and war in Ukraine – imposed new approaches in terms of informational security. Unfortunately, the trends of digitalization in the whole world are spreading much faster than the regulator and the legal framework is regulations its relations. It is necessary the digitalization of the national financial-banking sector that is outdated, but has a big potential. In conclusion, it was mentioned that the innovations in Fintech in the Republic of Moldova: *...this represents biggest possibilities, and the technologies of payment from other countries and the segment of Fintech is most innovative, currently the NBM has two big project the implementation of the Directive PSD 2 and the draft of the instant national payments...* Republic of Moldova has no other option that to embrace the innovations and this might be done purely in cooperation between the regulator, state authorities, investors and market actors (Bizlaw, 2022b).

The actors on the financial market consist not only by the banks but also by other service providers. The payment service providers are tending to switch from "traditional banking" to the concept of "open-banking". The regulator is working on the modifications of the legal framework. According to the General Directorate of Communication and Public Relations of the Parliament, "open-banking" is a banking practice that offers third-party providers of financial services open access to the financial data of consumers from banking and non-banking institutions, under increased security conditions. The new regulatory framework aims to increase competition, innovation and diversity in the electronic payments industry, mentioned the specialists of the National Bank of Moldova.

In this meaning, the legal framework that is under modification are: the Law on the National Bank of Moldova, the Fiscal Code, the Law on Currency Regulation, the Criminal Code of the Republic of Moldova, the Law on Payment Services and Electronic Currency etc., which were amended in the first reading. Consequently, the list of activities covered by the law is expanded with two more areas: "payment initiation services", "account information service".

The legislation has as main target to give access on the market to the providers on the existing payment systems in order to give them the opportunity to carry out their activity without arbitrary and unjustified restrictions (Bizlaw, 2022a).

The new modifications of the draft of the above mentioned legal framework has several directions: the control from the National Bank of Moldova on certain activities of the service providers, in order to ensure a homogeneous interpretation of the rules at the level of the internal market; it specify additional conditions for the authorization and registration of the providers of the new

services – payment initiation and account information, through a professional indemnity insurance or similar guarantee; the requirement to present information relating to administrators - management bodies and their members, but also to persons holding key positions within the non-bank payment service provider, is amended.

Another important aspect to be regulated by the Criminal code draft is the list of breaches is supplemented with the specific breaches of the term and requirements for examining complaints of payment service users.

Also, the existing regulatory framework in the field of personal data is adjusted to avoid violating the rights of users and providers at the same time.

The act is part of the measures to harmonize the payment services market with European Union standards (Bizlaw, 2022a).

Digitalization is a key priority not only for private banks and the entrepreneurs but also for the government. The Government of the Republic of Moldova constantly is working on changing of the digitalized services for the final beneficiaries. The strategic program for governance technological modernization presented by Mr. Țurcanu I., current Minister of Digitalization at the conference in Ankara consists of following: promoting the principles of open government, public service digitalization, reengineering of public services and operational processes, providing modern channels of access to public services, shared government technological platform, ensuring information security, application of innovative technologies, IT capacity building in public and private sector and enabling a favorable regulatory, policy and standards framework (Țurcanu, 2019). The government initiative is very important for private financial-banking sector, as better and quicker access will have banks to the public registers and data from public registers it will improve the negotiation process of the signing a contract and officializing a relation between the banks and clients, in particular in online medium.

3. CONCLUSIONS

The digitalization of the banks go hand to hand with the modernization of the legislation in force. It implies not only financial, human resources and strategical effort from the banks but also the banking regulator have to take the necessary measures in order to implement the new trends in banking digitalization.

Despite the fact that the digitalization of the banks is a key priority for every bank it still involved some risks that has to be taken into account as for example the security of the data transmitted by the clients, data protection and data processing. The financial-banking services is going through dramatic changes as an effect of the changing of the behavior of the clients, innovative use and adoption of the new technologies and overall in digitization of the business and of the society. The digitization on one hand is very expensive in

implementing new systems but on the other hand it will reduce costs in future, the increasing of the top revenue is also a key driver in particular in retail banking.

Self-service analytics & data literacy is another important strategic domain for bank that needs to be addressed as implies the education of the clients, the clients literally have to be educated by the bank how to use the data offered by the bank or by the bank's platforms. On the other hand, the bank has to have a connection with the client to identify the client in order to avoid the frauds that lately has been constantly increasing.

It was observed a trend of the banks to modernize their services and products and to offer more products in online medium as the target to attract new clients. However, taking into account the financial culture of the Republic of Moldova the classic banking will be present for a longer period.

As it was discussed previously the digitization of the banks involves many positive effects as: cost reduction – on a long term vision, customer focus, as it is focusing on a particular group of customers in online medium, developing of new offers and products from the banks also give a new fresh vision to the business of the bank, branch consolidation (in special in branches in small regions), analytics of the data and of the behavior of the customers based on the historical relation, improving of the business functions and processes in order to achieve better results and better revenue.

Another important aspect is to address the new technologies as Fintech and block chain technologies in developing the internal processes and business revenues.

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THE PRINCIPLE OF NON-RETROACTIVITY IN TAX LAW

DANIELA CONSTANTIN-VOROVENCI

*West University of Timișoara
Timișoara, Romania
daniela.constantin@dcvlaw.ro*

Abstract

Most normative legal analysis is devoted to determining which procedures or policies society should prefer. Any divergence between the current legal regime raises the question of citizens' basic rights regarding their legal situation. This Article uses legal and economic analysis to evaluate the non-retroactivity of law.

Part 1 of this Article provides a broad illustration of the principle of non-retroactivity and its dimension in Romanian tax law.

Part 2 of the Article extends the theoretical research on the principle of non-retroactivity in comparative law. The purpose of the analysis is to highlight to what extent the principle, in the form regulated in the Constitution of Romania, supports certain nuances compared to other countries.

Part 3 of the Article deals with the practical side of the problem. Thus, based on concrete examples identified in the tax law, we tried to determine if the constitutional transformation of the non-retroactivity in the form adopted by the constituent legislator, by reference to the specifics and limits of the tax law, is the only solution to guarantee the elimination of any abuses of legislation and strengthening legal certainty.

Title 4 of the Article contains our conclusions on the phenomenon under consideration.

Keywords: *principle of non-retroactivity; non-retroactivity; legal certainty; legal security.*

JEL Classification: H20, K34

1. INTRODUCTION: RELEVANT PROVISIONS IN NATIONAL LAW

The principle of non-retroactivity of the new fiscal law is regulated in art. 15 para. (2) of the Romanian Constitution, which establishes as follows: “The law disposes only for the future, except for the more favourable criminal or misdemeanour law.”

The postulate establishes two rules closely related: first, using a positive norm, *ratione temporis* authority is recognized by the new law (seen *lato sensu*), starting only from the date it entered into effect. Moreover, a prohibitive norm eliminates any power over the past, thus preventing retroactivity.

Concerning justifying the principle of non-retroactivity of the law, in the absence of an express consecration in the Constitution, relevant literature showed that “if what has been done according to the law in effect could constantly be disturbed by the new law, any provision in time would be

impossible. The legal order itself would be threatened as the trust in the security of rights, and the stability of the civil circuit would weaken” (Eliescu, 1967, p. 77).

In the same line of argumentation, the French doctrine stated that “if a person obeying the order of the law could be disturbed under the reason that a subsequent law modified the terms of the previously existing regulation, the law would lose any power because nobody would dare execute the orders of the law, out of fear of deeds which, legitimately overturned, would then be criticized by a new and unknown law” (Terre, 2009, p. 469).

Regarding the fiscal law, Matei Cantacuzino withheld that the public law relations „are retroactive by their nature, in the sense that concerning the regulation of the relations between the state powers and the individual wills, the need for unity, equality, and uniformity, which is at the basis of any social organization, does not allow that the new regulation is opposed by individual interests and aptitudes which the old law had recognized. Such are [...] also, in general, all laws establishing the personal obligations and rights concerning different branches of the state powers” (Cantacuzino, 1921, p. 26).

More precisely, before the 1991 Romanian Constitution, the focus of non-retroactivity was only placed on private law relations born under the old law, which did not extinguish all effects they could produce in time. The specialty doctrine withheld that, in fiscal law, the new rule applies only to the legal situations after they entered into force. The dispositions with fiscal character in the laws adopted after 1989 consecrated this principal orientation (Bufan, Buidoso and Şvidchi, 2016, p. 421).

Therefore, we notice and all doctrine shapers agree that the principle of the non-retroactivity of the law is essential for protecting human rights before the law. The fundament of the non-retroactivity of the new law resides in the fact that the law, seen as an order, cannot impose that a deed occurs according to its dispositions except after it has been issued, hence, only for the future.

2. EUROPEAN REGULATION MODELS ON THE NON-RETROACTIVITY PRINCIPLE

In France, the concept of retroactivity, even though having constitutional value, is regulated in art. 2 of the Civil Code, according to which “the law disposes of only for the future; it has no retroactive effect ”; in the contrary case, a retroactive law would be susceptible to contradict the principle of legal certainty, which imposes to the taxpayer the possibility to predict, to a reasonable extent, the consequences of a certain deed, at the moment when the respective act occurs (Bamdé, 2016).

With respect to the application of the French law in time, it was shown that “a retroactive law (most often an interpretative law) cannot be retroactive unless at most until the date when the last modification of the interpreted text was made

and published, meaning that it can affect only the last configuration of the interpreted text” (Bufan, Buidoso and Şvidchi, 2016).

In other words, a fiscal law is considered retroactive when the new taxation applies to taxable events before the new law’s promulgation. (Terre, 2009). At the level of the French constituent, it is acknowledged that the judge recognizes the lawmaker’s freedom to adopt a law retrograde, provided that two constitutional limits are respected: “The principle of non-retroactivity of the punitive law and respect for the binding nature of judicial decisions.” (De Crouy-Chanel, 2010)

In Germany, according to legal literature, “the German Constitution allows the retroactivity of the law, but the practice of retroactive fiscal legislation is considerably influenced by the extended jurisprudence of the German Constitutional Court (Hey, 2010).

For almost 50 years the Constitutional Court practice on retroactive tax legislation has been quite steady. However, very recently the Court significantly changed its approach to retrospectivity. In three judgments of 7 July 2010 the Court strengthened the position of the taxpayer'. Due to several requests for constitutional review of German fiscal courts and some constitutional complaints by individual taxpayers the judges at the Constitutional Court also granted protection against changes which are considered to have only retrospective effect. This new development is not yet reflected in the academic debate, yet will probably affect it to a considerable extent (Hey, 2010).

From the perspective of German law, a law is considered to have a retroactive effect when applied to the transactions or operations performed before the promulgation of the new law. Hence, the settlement criterion of a potential conflict targeting the application of the German law in time is the “taxable event.”

In Belgium, like the other legal systems, the principle of the non-retroactivity of the law is not regulated in the Belgian Constitution but in ordinary law, the postulate being established in article 2 of the Civil Code. According to the doctrine, the principle of non-retroactivity of the law, as regulated in Belgian law, “also applied to the fiscal law” (Peeters and Puncher, 2013). The Belgian law makes a distinction between “retroactivity” and “retrospectivity,” and to separate the two, the older Belgian literature used the expressions «relative retroactivity» and «absolute retroactivity». Related to fiscal law, with respect to the income tax, both the doctrine and the jurisprudence made a distinction between “de facto retroactivity” and “actual retroactivity” or legal retroactivity (De Page, 1962, p. 328).

Because of the fact that this differentiation was considered arbitrary in the academic space, the more recent legal discourse made a clear distinction between three concepts, namely «immediate effect» «current effect» and «secondary effect». Thus, as a general rule, it is considered that a legal

regulation has an “immediate” or “retrospective” effect (Peeters and Puncher, 2013). This distinction implies that a new legal regulation applies both to legal deeds that occurred after the date of entry into effect of this new piece of regulation and to the legal consequences arising after the date of its entry into force, even if these consequences refer to those that occurred before the respective date. For example, a new legal regulation applies to all corporate expenses after it enters into effect, even if performed before this date.

Concerning the theoretical and practical benchmarks presented, we note the following elements about the concept of retroactivity in tax law. Namely, comparing the legislation, doctrine, and practice crystallized in our legal system with those that did not expressly regulate the non-retroactivity principle, we believe that, at least from the perspective of legal security, the taxpayers’ rights enjoy higher protection when the Constitution protects the postulate of non-retroactivity.

3. THE MATTER FOR ANALYSIS

The principle of the non-retroactivity of the fiscal law, as it is regulated in our legal system, does not allow any distinction between laws, regardless of the regulation field, of course, with the exceptions established by art. 15 para. (2) din Constitution: the more favourable criminal and misdemeanour laws (Constitution of Romania, 1991). Therefore, in principle, the theoretical and practical issues of applying the non-retroactivity principle are set by the constitutional character of this postulate.

However, we consider that another question can arise. It is important to establish whether the constitutional consecration of the non-retroactivity of the law, in the form adopted by the constituent lawmaker, related to the specifics and the limits of fiscal law, is the only solution to guarantee the elimination of all abuse from the work of law-making and of consolidating legal security.

Until now, the national doctrine explained the need to insert the principle in the Romanian Constitution based, mainly, on preserving legal security and the respect and guarantee of the rights of citizens. In what concerns us, even though we do not deny the value and importance of the postulate, we believe that the constitutional regulation of non-retroactivity, in the form adopted by the constituent lawmaker, does not represent the only solution to guarantee the elimination of all abuse from the work of law-making and of consolidating legal security, but, very often, this modality is an obstacle on the path to legal evolution.

One of the reasonings at the basis of our conclusion is grounded on the example of other states with a democracy consolidated over centuries, such as France or Germany, which, even though they confer the postulate constitutional value, maintain the principle of non-retroactivity only in the Civil Code.

Among the effects of not-regulating it at the constitutional level is the rule according to which the principle binds only the one applying the law and not also the lawmaker, who can give retroactive character to the law, provided that this character is expressly mentioned; in fact, the interpretative laws have, in principle, retroactive effect, even though they cannot be adopted without limits. This rule allows the lawmaker to adopt measures according to the current needs of society. Still, this possibility must not be understood as having an absolute character. The lawmaker can retroactively legislate only considering general interest reason(s) and under the reservation to not deprive the constitutional difficulties of legal guarantees.

The second argument is based on the circumstance that Romania is not the only country that understood the necessity to raise the principle of non-retroactivity at the constitutional level, but also other states, such as Greece (Constitution of the Hellenic Republic, 2008), Portugal (Constitution of the Portuguese Republic, 1976) and Sweden (Constitution of the Kingdom of Sweden, 2016). However, from the content analysis, we cannot ignore the severity that the Romanian lawmaker chose to confer the postulate, compared to the other states, which opted to provide the ordinary lawmaker the possibility to adopt retroactive measures in exceptional situations. Thus, according to:

- art. 78 point 2 of the Constitution of the Hellenic Republic: "a tax or any other financial charge may not be imposed by a retroactive statute effective prior to the fiscal year preceding the imposition of the tax" and at point 3 of the same regulation, it establishes the general framework for other exceptional situations, such as import/export taxes or in case of a consumption tax, their collection being allowed starting from the date when the draft law is submitted to the Parliament.

- art. 103 para. (3) of the Constitution of the Portuguese Republic: "no one shall be obliged to pay taxes that are not created in accordance with this Constitution, are retroactive in nature, or are not charged or collected as laid down by law".

- art. 10 para. (2) of the Constitution of the Kingdom of Sweden: "No taxes or charges due the State may be imposed except inasmuch as this follows from provisions which were in force when the circumstance arose which occasioned the liability for the tax or charge. Should the Riksdag find that special reasons so warrant, it may however lay down in law that taxes or charges due the State shall be imposed even though no such act had entered into force when the aforementioned circumstance arose, provided the Government, or a committee of the Riksdag, had submitted a proposal to this effect to the Riksdag at the time concerned. A written communication from the Government to the Riksdag announcing the forthcoming introduction of such a proposal is equated with a formal proposal. The Riksdag may furthermore prescribe that exceptions shall be made to the provisions of sentence one if it considers that this is

warranted on special grounds connected with war, the danger of war, or grave economic crisis”.

Not least, our conclusion is based on the practice of the ordinary lawmaker. Thus, although forbidden with absolute character, national fiscal law abundant in measures with retroactive character; some are unchallenged only due to their good nature for the taxpayers. In support of our arguments, we analyse and investigate the effects of the following particular situations:

(a) Fiscal amnesty laws

Several amnesty laws have been passed in Romania in the last five years and, we all know, this kind of law produce effects of the past. And this because these categories of laws are based on a specific characteristic, namely the establishment of a “reference date” that is always before their entry date into effect. For instance, in the case of Ordinance no. 6/2019, which entered into effect on 5 August 2019 the reference date was set for 15 December 2018. In the same way, in the case of Government Emergency Ordinance no. 69/ 2020, which entered into effect on 14 May 2020, the reference date was set for 31 March 2020.

From the content point of view, both above mentioned regulations include the cancelation of accessories generated by the taxes, fees, and contributions born in the past, fully concluded on the reference date. In this context, the view the law professionals give to these categories of regulations is also relevant. Thus, the most recent amnesty law was interpreted in the sense that the beneficiaries are not only those paying debts outstanding on 31 March 2020, in the conditions and terms expressly established by the regulation, but also “those who accumulated accessories prior to the date of 31 March 2020 and who paid before 31 March 2020 the main obligations that generated the respective accessories” (Mitroi, 2020).

We do not share this interpretation because the lawmaker imposes an essential condition, namely the existence of outstanding debt (or with the prior due date) on 31 March 2020. These debts can also be established later if the main budgetary obligations with due dates before and including 31 March 2020 are corrected. This conclusion can be derived from the literal interpretation of art. XI of Government Expedite Ordinance no. 69/2020: “The cancelation of the accessories afferent to the main budgetary obligations with due dates before 31 March 2020 and extinguished until this date. The interests, penalties, and accessories afferent to the main budgetary responsibilities with due dates before and including 31 March 2020 and extinguished until this date are cancelled if the conditions are set in art. IX letters b)-d) are cumulatively and duly fulfilled.”

This text sets, with its unfortunate formulation, the legal framework for the cancelation of accessories afferent to certain main budgetary obligations with due dates before 31 March 2020 and extinguished until this date, and not by far

the legal framework for refunding the accessories as a consequence of enforcing the amnesty law.

From our point of view, in this category, we can include, for example, the main tax obligations which, on the reference date, made the object of litigation and benefitted from the effects of the suspension of the fiscal, administrative act, debts paid by the taxpayers to prevent possible burdening duties.

The waiver of the dispute to benefit from the amnesty program makes the budgetary obligations suspended before 31 March 2020 become enforceable, but their payment was made before this reference moment.

Due to the immediate effect of the amnesty laws modifying the fully concluded legal situation of the regulation beneficiary, even though sometimes necessary, independent of the lawmakers' will, they represent manifestations of retroactivity, in complete contradiction with the Romanian Constitution.

(b) The fiscal regime on expenses with interests, established in art. 40 ind. 2 para. (9) from the Romanian Fiscal Code 2015

According to the fiscal regime established in art. 27 of the Fiscal Code of 2015, expenses with interests were “fully deductible if the capital indebtment degree was lower than or equal to 3”. The lawmaker also concretely established the manner of determining the indebtment degree. At the same time, art. 27 para. (4) of the Fiscal Code of 2015 also regulated the situation of exchange rate differences; thus, if the expenses with the exchange rate differences exceeded the incomes from the exchange rate differences “affluent to the loans taken into account in establishing the capital indebtment degree,” the net loss “will be treated as an expense with interests, deductible according to para. (1).”

For the hypothesis when the capital indebtment degree was above the regulated threshold (i.e. three), the fiscal regime of “expenses with interests and the net loss from the exchange rate differences affluent to the loans taken into account in establishing the capital indebtment degree” was set according to para. (5) of the same article, saying that the expenses were considered not deductible, allowing, however, the possibility to carry them forward “to the following period, in the conditions of para. (1), until their full deductibility”. We can thus notice that the lawmaker established an uncertain time for the full recovery of this type of expense; in principle, the substance of the law is preserved.

The right to carry forward the expenses with interests and the net loss from the exchange rate differences was also recognized as “taxpayers ceasing to exist as the effect of a merger or division operation,” and it transfers the expenses “to the newly established taxpayers, respectively to those who take over the patrimony of the absorbed or divided companies, as the case may be, proportional to the assets and liabilities transferred to the beneficiary legal entities, according to the merger/division project.”

Following the abrogation of art. 27 of the Fiscal Code of 2015, under the new tax regime, all interest expenses and exchange rate differences arising under

the old law (expenses related to 2016 and 2017) and not deducted by the date of entry into force of the new rules were considered fully deductible, with immediate application, it no longer takes into account the state of debt of capital.

From the investigation, on the one hand, of the moment of the birth of legal situations and, on the other hand, of the effects of the new law on them, it is noted that (i) the legal situations arising under the old law and (ii) the effect of the new law, the full deduction of interest expenses and exchange rate differences alters the effect of the old law – deductibility conditional on the degree of indebtedness. However, all these elements lead to a result, namely, although more favorable, the text analyzed is retroactive.

(c) The fiscal regime on leasing contracts established in art. 45 para. (5) Fiscal Code 2015

Art. 29 Fiscal Code 2015, named “The leasing contracts”, was supplemented by art. I point 14 of Law no. 296/2020, occasion for which two new paragraphs were added, directed at the fiscal regime applicable to taxpayers applying the accounting regulations according to the International Financial Reporting Standards, i.e., para. (4) and (5) from Fiscal Code 2015.

At the same time, art. 45 of the Romanian Fiscal Code of 2015 was completed, in the sense that the new regime was introduced by art. 29 para. (4) and (5) also apply to contracts concluded “starting with the date of entering into effect of this law.”

From the analysis of art. VII of Law no. 296/2020, which regulates aspects related to the entry into effect of the new regulation, we noticed the changes brought to art. 29 and art. 45 of the Fiscal Code of 2015, where no special rules are instituted; therefore, applying the general rules, the new fiscal regime entered into force within three days from publication, respectively, on 24 December 2020. The problem appears when we set the date of entry into effect of these measures because of the dispositions of art. 45 of the Fiscal Code of 2015 ordered the new regime introduced by art. 29 para. (4) and (5) also apply to contracts concluded “with the date of entering into effect of this law.” What concerns us is the fiscal regime on leasing contracts, under the scope of the situations regulated by para. (4) and (5), applicable only to those arising after 24 December 2020.

The use of the expression “starting with the date of entering into effect of this law” transposed into the Fiscal Code represents, in fact, an error of the lawmaker. Still, until a possible change, the literal interpretation of art. 45 para. (5) of the Fiscal Code of 2015 is that the new legal regime applies to contracts concluded starting with the date of the entering into force of this law, respectively 1 January 2016. In these conditions, it is evident that the new law changes the effects of the old, the new regime, thus being retroactive.

(d) The fiscal regime on cash registers

Art. I of Law no. 153/2020, modifying art. 25 para. (4) of the Fiscal Code of 2015 establishes that starting with the 1st of August 2020, "the expenses representing the cost of purchasing electronic fiscal cash registers, on the date of their commissioning [...]" are considered non-deductible expenses. According to the new fiscal regime, the taxpayers purchasing electronic fiscal cash registers deduct their purchase cost from the unpaid profit tax, according to the used declaration and payment system. The amounts not deducted from the profit tax are carried over in the next 7 years, the recovery occurring in the order of their registration, in the same conditions, at every payment term of the profit tax.

Art. II of Law no. 153/2020 extends, retroactively, the deduction also for the purchase of cash registers bought in the years 2018 and 2019 and in the first seven months of 2020, on the condition that, on the date of making this operation, the taxpayers were payers of profit tax. More precisely, the expenses afferent to the purchase of electronic fiscal cash registers bought and commissioned in the year 2018, the year 2019, as well as those designated in the year 2020 before the entering into effect of the new law were assimilated into the expenses not deductible when calculating the profit tax, amounts that were, however, deducted from the profit tax of the year 2020. The amounts not deducted from the profit tax were carried over seven consecutive years.

In the case of taxpayers paying profit tax, questions arose regarding how these new provisions correlated, from the accounting and fiscal viewpoint to the already existing regulations, given that the new cash registers are registered in the accounting as fixed assets and are monthly amortized. Some taxpayers have already benefitted from a fiscal incentive to purchase new cash registers using the facility regarding reinvested profit.

Through Law no. 296/2020, art. 45 para. 7 of the Fiscal Code of 2015, in effect starting with 24 December 2020, clarifications were made to the derogatory fiscal regime, in the sense that the taxable persons "who, when determining the profit tax afferent to the year 2020 deducted the purchase cost of the electronic fiscal cash registers bought and commissioned during the years 2018 and 2019, according to Law no. 153/2020, for which they applied the provisions of art. 22 in the respective years, add to the tax owed the value of the exempted profit tax afferent to these cash registers".

We identify similar rules in the matter of microenterprises through Law no. 153/2020; on the one hand, the old fiscal regime allowed the deduction of the purchase value of the cash registers from the taxable basis in the trimester when they were commissioned being abrogated, like regulated by art.53 para. (3) of the Fiscal Code of 2016, and, on the other hand, a new fiscal regime being regulated. Thus, according to art. 16 of the regulation analysed, the microenterprises purchasing electronic fiscal cash registers, deduct the purchase price afferent to them from the income tax of the microenterprises in the trimester when they were commissioned, within the limit of the income tax of

the microenterprises owed for that respective trimester. The amounts not deducted from the tax owed on the income of microenterprises are carried over to the following trimesters for 28 consecutive trimesters.

Also, in this matter, the lawmaker adopted retroactive measures, the taxpayers paying tax on the income of microenterprises having the possibility, at the level of the four trimester in 2020, to recover the costs incurred with the purchase of electronic fiscal cash registers commissioned in the year 2018, in the year 2019, as well as those designated in the year 2020 before the entering into effect of the new law, by deducting them from the tax on the income of microenterprises. This is regulated by art. II para. (3) and (4) of Law no. 153/2020.

Even though the principle of non-retroactivity has absolute value, we cannot ignore the reason of the lawmaker, which was the basis of adopting this measure, cause loosely related to fairness: "in the situation at hand, the replacement of the fiscal cash registers with electronic journals most probably had the enrichment of those several companies trading these models of cash registers. All categories of economic operators were forced to use this new system starting in 2019. If the Romanian state cannot elaborate predictable regulations to benefit the business environment, then, at least, it should allow the companies to deduct the expenses (which, again, are imposed by the state for the tax they must pay". (Romanian Parliament, 2019).

(e) Modification of the ceiling for establishing taxpayers' capacity to pay tax on microenterprises' incomes from 100.000 euro to 65.000 euro

According to 112 ind. 6 of the Fiscal Code of 2003, in effect on 1 January 2013, if during a fiscal year a microenterprise achieved incomes higher than 100.000 euro, it was obliged to pay profit tax, the taxable basis being constituted of the entirety of revenues and expenses made from the beginning of the fiscal year, the calculation and payment of the profit tax being made starting with the trimester in which the limit set by the lawmaker was exceeded. Through Government Emergency Ordinance no. 8/2013, in effect since 1 February 2013, the legal text was modified in the sense that: "[if] a microenterprise achieves incomes higher than 65.000 euro during a fiscal year, it will pay profit tax considering the incomes and expenses made from the beginning of the fiscal year. The profit tax calculation and payment are made starting with the trimester in which the limit set in this article was exceeded. The profit tax owed represents the difference between the profit tax calculated from the beginning of the fiscal year until the end of the reporting period and the tax on the incomes of microenterprises owed during the respective year".

The taxable persons are applying the tax regime on the income of microenterprises, who registered during the year income exceeding the ceiling of 65.000 euro, then, with retroactive effect, were following the profit tax regime.

From the interpretation of the legal text, it is noticed that the profit tax was determined both by relating to the income registered before exceeding the ceiling and to the income achieved prior to the entry into effect of the changing regulation. Concerning this example, we consider that we are witnessing economic retroactivity.

Regarding to the concept of the economic retroactivity, this phenomenon typically concerns periodic taxes and covers situations in which the taxable event is not yet legally complete when the new law becomes effective, but certain of its elements predate the new law's entry into force, to which the new law nevertheless declares itself applicable, including the part under-taken prior to its entry into force and that was, therefore, still under the aegis of the old law. Thus, the new tax law encompasses those elements of the taxable event that predate it, even though the taxable event is ultimately completed after it came into force as our example (Haslehner, Kofler and Rust, 2019).

(f) Modification of the fiscal regime for non-resident individuals, established in art. 59 para. (2) and art. (2)1 of the Fiscal Code of 2015

According to art. 59 para. (2) of the Fiscal Code of 2015, in effect since 1 January 2021, following the change brought by Law no. 296/2020: "the non-resident individual fulfilling the residence condition established in art. 7 points 28 letter b) is subjected to income tax for the incomes obtained from any source, both in and outside Romania, starting with the first day in which he/she declares that the center of their vital interests is in Romania". Also, through Law no. 296/2020 art. 59, the para. 21 was introduced, according to which: "the non-resident individual fulfilling the residence condition established in art. 7 points 28 letter b) is subjected to income tax for the incomes obtained from any source, both in and outside Romania, starting with the first day of arrival in Romania".

Thus, with Law no. 226/2020, the moment from which the individuals fulfilling certain residence criteria have a complete fiscal obligation in Romania was changed, being established depending on the criterion determining residence:

- i. in case of center of vital interests, from the date when it is declared in Romania and,
- ii. in case of the physical presence criterion, retroactively from Romania's arrival date.

Before this change, the non-resident individuals fulfilling the residence conditions (consisting in the center of vital interests or the criterion of physical presence longer than 183 days) were subjected to income tax for the incomes obtained from any source, both in and outside Romania, starting with the date when they became resident in Romania, this moment not being established at the level of the law, but instead left at the level of the subjective consideration of the

fiscal body (following the submission of the questionnaire established by Order no. 1099/2016).

From the perspective of legislative technique regulations, we notice the new dispositions of para. (21) have not been correlated with the provisions of para. (3) of art. 59, which establish an exceptional situation only for the individuals proving to be resident of states with which Romania has concluded agreements to avoid double taxation. More precisely, the new rules are applicable only for the individuals declaring the center of their vital interests in Romania and not also for those having a physical presence longer than 183 days in Romania.

Still the provisions of the agreements for the avoidance of double taxation will be applied (on the grounds of the principle of priority consecrated in art. 1 para. (3) of the Fiscal Code of 2015) also to individuals fulfilling the criterion of physical presence longer than 183 days, who will become fiscally resident with the whole fiscal obligation in Romania only after going through the hierarchical criteria established in art. 4 para. 2 of the Agreements.

Then, returning to the research topic, we notice that by changing the start moment of the whole financial obligation through Law no. 296/2020, a retroactive intervention occurs on the factual situations prior to 1 January 2021. It is thus possible that an individual with the center of his vital interests in Romania before the date of 1 January 2021 had become fiscally resident based on the subjective criterion of the consideration of the fiscal body (established by the primary form of art. 59 para. (2) of the Fiscal Code of 2015), but becomes fiscally resident at the moment well in advance to the date of 1 January 2021 for the simple reason that he declares the center of his vital interests, for example, on the fate of 1 January 2019. In this situation, these persons will be obligated to declare and pay taxes in Romania for their worldwide incomes starting on 1 January 2019.

Or, to observe the non-retroactivity principle in what concerns the dispositions of para. (2) and (21), we consider that the lawmaker should have ordered that their application applies only to the factual situations occurring starting with the date of 1 January 2021, whether we speak of the criterion of the center of vital interests in Romania or of the arrival in Romania for a period to be set for more than 183 days.

4. CONCLUSIONS

The examples given show that, even though for the constituent lawmaker, the consecration of the principle of non-retroactivity of the law represented (maybe) the only solution to guarantee the elimination of abuses from law-making work, the excess and arbitrary have never entirely been rejected.

Moreover, independent from the lawmaker's intention, practice proved that different situations might occur in social life, which calls for the need to adopt measures with retroactive effect; thus, maintaining the principle, in its current

form, in the supreme law does not represent the happiest solution, the ordinary lawmaker being held by the limits of the supreme law.

All these shortcomings regarding the absolute character of the non-retroactivity principle impose the rethinking of the institution because the postulate must consider the social realities and the generality of the law; thus, with the occasion of the review of the Romanian Constitution, we appreciate as opportune the change of art. 15 para. (2) of the supreme law.

From our point of view, the most just solution, which correctly implemented and applied would allow the tax legislator specific derogations, is that adopted by most Member States of the European Union, namely to regulate the principle of non-retroactivity only in the Civil Code. Because the rule is enshrined in ordinary law, it may be waived under exceptional circumstances and be removed by another law of the same or higher degree.

We consider the rule stated in Article 6 of the Civil Code: “civil law is applicable if it is in force. It has no retroactive power” – a general provision on the application of the intertemporal law provides, along other instruments, a fundamental guarantee of public freedom.

In addition, concerning the despotism of the national fiscal lawmaker who still refuses to embrace the rules guaranteeing the taxpayers’ rights and liberties, respectively the principles of legal security and protection of legitimate trust – consecrated in the civilized states, we support *de lege ferenda* the distinct regulation of retroactivity in the fiscal matter, the insertion within art. 139 “Taxes, fees and other contributions” of a new paragraph that could have the following content: “(3) No tax or any other financial duty can be imposed through law with retroactive effects, which would target the year before the draft law is submitted to the Parliament, on condition that the law is published within the term indicated in art. 78”.

In this sense, the single law-making authority of the country is recognized by the Parliament and not also by the executive power, which abuses the institution of legislative delegation, the instrument necessary to set things in agreement with the social realities.

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CONTRACTUAL MECHANISMS IN BUDGETARY FRAMEWORK: A SPECIAL VIEW ON EU GRANTS

IOANA MARIA COSTEA

*Alexandru Ioan Cuza University of Iași
Iași, România
ioana.costea@uaic.ro*

DESPINA-MARTHA ILUCĂ

*Alexandru Ioan Cuza University of Iași
Iași, România
despina.iluca@uaic.ro*

Abstract

The budgetary framework defines itself in relation with two significant pillars: the public source of revenues and the general private legal context. Budgetary funds, national or European, are significantly relying on contractual mechanisms to ensure the execution of a budgetary credit. These contractual elements are a concoction of strict regulations deriving from the purpose of protecting public interest and of supplier regulations sustaining an efficient expenditure operating model. In this framework, EU grants are a specific instrument for attaining socio-economic purposes that have a high contractual profile. The present study will address the givens of budgetary execution in the EU context by applying general contractual standards to this domain. This analysis will allow us to identify commonalities and individualities of EU grants. The method used is a general analysis of contractual mechanism, allowing to identify the behavior of EU grants as to the features, subjects, object, provisions, execution, and termination of the contractual link.

Keywords: *budgetary credit; grant contract; European funds; contractual remedies; budgetary resilience.*

JEL Classification: K34, K41

1. WORKING HYPOTHESIS

The efficiency of EU funds expenditure is an objective of the implementation of the European budget (European Court of Auditors, 2018). The causes contributing to an efficient expenditure are multiple; a specific input is given by the legal dimension, including management of irregularities (European Commission, 2020). An irregularity is a concurrence within a contractual relation that endangers or diminishes the needed results (European Court of Auditors, 2019). The content of the irregularity is generated by a flaw in the conclusion or/and implementation of a contract. Thus, the theory of the

contract is relevant in evaluating the degree of compliance of a certain behaviour in a grant scheme, which will determine the budgetary result.

The link between contractual theory and public expenditure is very tight; a vast majority of public expenditure is engaged through contractual bonds. These bonds can be set in motion as labour contracts (or public service contracts), procurement contracts (Costea, 2015; Costea, 2018) or in some financing programmes by grant/subsidy contracts. The main contribution of the legal theory to the mechanism of public expenditure is to identify a legal pathway both correct and predictable for the formation and execution of these contracts. Legal theory draws a model of formal conduct to reduce or even eliminate economic risks related to the contract. These elements govern the formation of the contract (highly formalized through procurement procedures) and the execution or even dissolution of the contract (governed by the common regulation regarding contracts, with some particularities). These particularities are extremely relevant as they determine the legal and budgetary relevance of the parties' comportment. The ultimate consequence relies in the efficient use of public fund (including European funds), thus a budgetary outcome can be modulated through contractual remedies. The legal approach of an irregularity can be seen as a resilient reaction of the budgetary framework to conserve or protect the public revenues or even to save the contractual bond when the public matter demands it. One example of this view derives from the European Court of Justice, (ECJ, 2017) in Case ADR Center v Commission paragraph 44 where it is stated that *„the Commission is obliged to observe the principle of sound financial management. It also ensures the protection of the financial interests of the European Union in the implementation of its budget. The same shall apply in contractual matters, since grants awarded by the Commission come from the EU budget”*.

In the EU grant dynamics, the contractual flow is fragmentary; we have a contractual dimension in the agreement formed between the EU and the member state; a secondary contractual bond between the member state and the grant beneficiary; and a third contractual level between the beneficiary and its providers for the implementation of the financed project. This three-dimension contractual liaison contains a risk associated with the execution of the contracts; legal remedies gain economic and budgetary significance as the fate of the contractual dynamics is legally determined (Interreg Central Europe, 2019).

The aforementioned contractual liaison is relevant for our study for two main reasons: one is the causal dimension of the contractual bond and the other is the nature and extent of the dissolution of the contract. The study will apply a method of comparative analysis to identify the behavior of these two elements in grant matters. The general framework of the civil provisions governing all contracts will be examined in accordance with the budgetary legal framework. Thus, the study will signal similarities and differences and will generate an

inventory of norms applicable in this field (Ministry of European Funds, 2017; Ministry of European Funds, 2022).

2. THE NATURE OF GRANT CONTRACTS. SPECIFICITIES DERIVING FROM THE NATURE OF THE CONTRACT

The grant contract is an un-named contract, bilateral or multilateral, governed by high formalism. The formation of the contract follows a specific procedure, and the contract is an adhesion one. There is no special legal regulation for these contracts (hence the un-named nature). In the silence of the law, the contract is governed according to article 1168 of the Romanian Civil code by the general provisions of that title or by the norms of the most resembling contract. The principle of free-will is applicable; the parties have the freedom to conclude the contract with some limitations deriving from budgetary dynamics, as in the contractual relations generating a grant the participation of public entities is limited and imposed by the public interest, as foreseen through the budget. The co-contractor will participate according to its will when it considers it necessary, useful and in accordance to its own purpose. This subjective dimension cannot be defeated and the conclusion of a grant contract cannot be imposed, not even by the public interest. So, there will always be a risk of failure to contract when the imposed terms and conditions do not meet an accepting co-contractor (public or private party).

Regarding the causal dimension, we can state that a project is financed regarding the budgetary purposes quantified in the European Union budget and in accordance with the multiannual programme. Such devotion to a public purpose influences the principles governing this type of expenditure and how an expenditure is set in motion. The contractual element of purpose is shaped in a three-dimensional relation and a variety of interests occur. The grant contract differentiates from business-to-business contracts or business-to-consumer contracts due to the intervention of a public interest. We are in the presence of a contract governed by public law, as the contracting authority is implementing a set of objectives established by European policies. For example, the Recovery and Resilience Plan for Romania approved by the Council following a negotiation with Romania sets aims for the reforms and investments to be implemented by 2026 (European Commission, 2022) at the national level in the main dimensions of public policies. All grant contracts deriving from this line of financing will have in their purpose elements contributing to the aims of the RRPR.

Thus, the cause of the legal act (the grant contract) is also permeated by the public law dimension, as the objectives pursued by the contracting authority are set by the objectives of the European Union's policies, directly or indirectly (through national programmes). This characteristic determines the object of the contract, which is bilateral. Both parties, public (the financing authority) and

public or private (the co-contractor) are following a purpose by concluding the grant contract. For the financier, the cause of the contract is the consideration of the beneficiary's behaviour, which is in line with the objectives set by the European Union directly or indirectly (through the negotiation of the Partnership Agreement with the Member State). These objectives are relevant in the grand scheme of the programme and differentiated by the financed projects objectives. The desired results are indicated in the application form and become part of the contractual bond. This element allows to customize the mediated purpose of the contract to the specific needs of the European Union / state / region managed by the contracting authority. The actual beneficiary of the project's activities may be the financier (less often), the co-contractor himself or a third party. For the beneficiary, the cause of the legal act is mixed, namely obtaining public funding for his or her needs or the needs of a third party (in some cases the cause may be of an economic nature, but there remains a subsequent public need, which is met). So, there is a risk of failure to attain all the indicated results in a satisfactory manner.

The mixed nature of the grant's terms and conditions is given by this double subordination of the cause of the contract. The terms and conditions are proposed by the contracting authority as part of the programme call; a model of the contract is made public for the co-contractor to assess and decide according to its freedom to contract if a grant scheme is suited for its activity. The regulation applied to the grant contract is formed by a multitude of sources: legal provisions applied in relation to the public source of funding (highly public and transparent procedures); legal provisions from general contractual theory; contractual terms and conditions proposed by the contracting authority and individualized through the financing decision; programme special rules.

The grant contract is an adhesion contract. The terms and conditions are only partly negotiable, such as the proposed solution to the call's objectives, the value of the contract and its duration. Thus, the contract is a mixed clause contract (Codrea, 2021).

The grant contract is governed by a high degree of formalism; a transparent procedure of identifying the co-contractor is applicable, as is an exemption from the general rule of consensual contracts that may tolerate an arbitrary selection of the co-contractor. The contract can be concluded only in a written form, a regime highly reinforced in public contracts.

The object of the contract is given by the implementation of a project in accordance with the terms and conditions. The grant call will determine the actual object of the contract; for example, in a programme supporting environmental measures, the proposed project to be financed ensures measures for the management of waste in a specific area for a specific amount of time, with specific costs and specific results. Thus, the object of the contract is delimited in relation to a sum of money representing the non-reimbursable

subsidy (hence the similarity with the donation contract) and related to the content of a certain project, indicated by number and title (with a series of objectives of interest for the beneficiary and for the financier). The content of the contract is determined by selected projects to be financed according to the evaluation scheme established by the Applicant's Guide.

The object of the grant contract is a complex one; the parties agree to a gradient of obligations, all part of a project, in accordance with limited finance resources and a limited amount of time. The project will include various activities and will be set in action by a multitude of subsequent contractual bonds: labour contracts; selling contracts; service contracts etc. For example, a project regarding the reduction of unemployment can include a part of infrastructure, a part of academic content and a part of services, such as providing transport for the target group. This mixed nature cumbers the qualification of the grant contract and makes it difficult to determine the most resembling named contract, as *loci communi*. It is our opinion that a grant contract is a mixed nature contract, resembling both the conditioned donation and the enterprise contract, as the co-contractor is receiving funds to deliver results, but these results are not directly executed towards the financier.

Thus, the performance of the grant contract is related to the execution of the project; the two dimensions are separated elements. The beneficiary of the grant will execute the project and will report this execution to the financing authority, thus performing the contract. In consequence, the two performances are not identical; the completion of the project does not signify the completion of the contract. The first is a state of facts issue; the second is a legal issue. For example, an irregularity in the procurement procedure will affect the eligibility of costs, but will not eliminate the actual, physical results consisting in the deliverance of goods or a work and thus reaching the project's aims. Or the failure to respect the duration of the contract will not eliminate the obtained results. Therefore, the project can be completed within a contractual malfunction. The contract cannot be duly implemented without the proper implementation of the project. We can admit to an exceptional scenario where better project results are attained and do not affect the contractual viability.

The performance of the grant contract is determined by two sets of legal norms: general rules on performing contracts, *lato sensu* and general rules on the use of public funding. In this second realm, we can indicate a string of specific terms imposed to the co-contractor. Some of these conditions are optional in the general theory of contracts and become mandatory due to the necessity to enforce a stricter regime of public contracts. For example, the obligation of the beneficiary to submit documents to verify the performance of the contract (including an execution schedule) is an incident, which can be inserted in any contract, but has a mandatory dimension in the field of grant contracts, due to the public source of the subsidy. Accordingly, the financing contracts details the

control procedures, ex-ante and ex-post, the obligation to archive project documents, the obligation to return the amounts related to missing documents reimbursed from the project; the beneficiary's obligation to pay eligible co-financing and ineligible expenditures; the obligation to comply with public procurement regulations (regardless of the form of organization of the beneficiary and of the fact that it is a private entity); the obligation to draw up progress reports and requests for reimbursement; the obligation to carry out information and publicity measures regarding the source of funding and project activities. A certain imbalance of obligations is inevitable; the beneficiary of the contract is the weaker contractual party. It bears an ampler burden of obligations than the ones in similar 'civil' contracts and an ampler burden than the 'public' party. This burden implies a specific expertise of the beneficiary; in the case of grants financing private entities the presence and the consistency of this know-how is contributing to the contractual risk, as in the absence of this expertise the full performance of the grant is under threat.

3. DISSOLUTION OF THE CONTRACT

The dissolution of a contract can originate from valid implementation or from an invalid implementation of the terms and conditions (in the presence of an irregularity). The invalid implementation can derive from a failure of the parties. The sanction for the culpable non-performance of contractual obligations indicated by the grant contract is the termination of the contract (sic!). As a rule, subsidy contracts include an explicit right of termination in favor of the financer and clauses on full recovery of the amounts paid. As to the nature of this clause for dissolution of the contract, we ask ourselves whether we are in the presence of a resolution or a termination cause. This qualification is relevant as to the extent of the dissolution effects and raises some concerns about the equity of a full restitution. We are determined in stating that the time element is part of the problem, as a contract has a duration in time, but we express doubts regarding its immediate qualification as a contract with successive implementation.

The grant contract is a unitary contract; it has a sole purpose, explicit through the results targeted by the financed project. Considering the content of the project, the contract can behave (i) as an *uno actu* execution contract (for example, financing for the purpose of building a counseling center and its commissioning) or (ii) as a contract with successive execution (for example, the organization of a series of professional training courses). We appreciate that at the macro level, the financing contract is oriented towards a single object, namely the financed project; this project has fragmented components, the performance of which is done and verified in relation to the schedule of activities. These activities are usually heterogeneous and may include the execution of constructions, obtaining permits, arranging flows of activities (a business center, a museum, a production line), conducting these activities

(training, scholarships, underfunding). For this reason, we consider that in relation to the financier, the beneficiary is responsible for the proper performance of the entire project, under the sanction of dissolution.

Defilement of the obligation to start performing the contract, to fulfil the eligibility conditions (which appears to us more as a nullity clause, since the cause of ineffectiveness is prior to the conclusion of the contract) or double financing (the project is subject to another national or community public funding - likely to be qualified as a cause of nullity, deriving somehow from the illicit cause) are sanctioned with the termination (sic!) of the contract.

Defilement of individual obligations regarding the performance of the contract is sanctioned with its dissolution, which can be legally qualified either as a termination, doubled by the penalty clause of the full refund of the subsidy obtained regardless of the volume of activities performed by the beneficiary, or as a resolution, with the full restitution of the subsidy, e.g. POCU contract. In some cases, the contract stipulates that the restitution is proportional, e.g. POC contract clause 15 (4); Interreg contract clause 13 (1)). Regardless of the qualification, the termination operates through the effect of the clause included in the subsidy contract. We believe that under the conditions of article 1552 of the Romanian Civil Code, the declaration of resolution / termination takes written form. Considering that article 1554 para. (1) Civil Code states in the second sentence that: "... each party is required, in this case, to return to the other party the benefits received" and the beneficiary will not be reimbursed (since these are for his benefit, for the benefit of a third party and never for the benefit of the financier), we consider that it might seem more convincing to qualify the conclusion as a termination, followed by the application of the penalty clause.

The decision to terminate the contract appears as an administrative decision as it is ruled by the financier. This solution can be challenged before the Court. One example of this view derives from the European jurisprudence, (ECJ, 2014) in Case T-644/14, *ADR Center SpA v European Commission* paragraph 213, where it is stated that *in the event that the Commission adopts an enforceable decision to recover, from the co-contractor concerned, a contractual debt, that co-contractor has the possibility (...) of bringing an action before the Court (...) that co-contractor may not only challenge the legality of the above decision (...), but also raise pleas and arguments based on the contract or on the law applicable to it (...).*

As to the effect of this contractual dissolution under the principle *all or nothing*, we can notice a transfer of the budgetary risk. The European budget is protected; a non-performance or an irregularity generates no costs for the European financier. But some expenditures have been made; some results even have been attained (even for a tertial recipient). The contractual beneficiary is bound to its obligations towards his own secondary contractors. He will have to

honour these obligations even in the absence of the European financing. Thus, in the case of a public co-contractor the non-eligible expenses or the re-paid expenses following the dissolution of the grant contract will be incurred from the national or local budget that the beneficiary administrates. This will generate a budgetary deficit for the beneficiary imposed as a sanction for his inability to apply some formal procedures. This sanction should always be filtered through equity and oriented towards enforcing the resilience of public entities (and even private ones).

4. BRIEF CONCLUSIONS

The EU budgetary procedure measures success through the funds rate of absorption. This objective is inherent to the budgetary mechanism and is evaluated through standards of legality and regularity. These standards rely exclusively (as prior indicated) on legal provisions deriving from normative and contractual sources. This legal armour protects the policy aims and objectives anticipated through the budget and financed programmes. The study revealed the connection of these public law structures (budgetary law) to contractual dynamics. This connection is a form of protecting the financial interest of the European Union, but as we underlined raises the risk of terminating projects only on contractual irregularities or even destabilising budgetary entities.

The study is an introduction to this theme and an invitation for budgetary authorities to reevaluate the proposed contractual dynamics in a more sustainable manner, assuring a symmetry between protecting the financial interests and valuing the co-contractors' inputs in budgetary effecting.

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AIRLINE PASSENGERS' SATISFACTION IN THE CONTEXT OF COVID-19 OUTBREAK: COMPARATIVE ANALYSIS BETWEEN EUROPEAN LOW-COST AND TRADITIONAL CARRIERS

LAURA DIACONU (MAXIM)

Alexandru Ioan Cuza University of Iași

Iași, Romania

lauradiaconu_07@yahoo.com

Abstract

The COVID-19 pandemic brought many challenges to most of the economic sectors, at the global level. The airline industry was, however, among the worst affected. Throughout history, the airline industry has faced numerous challenges, but none of them had such a magnitude and so serious consequences as the current pandemic. It is known that service quality has been integrated as a major component in any business's strategic plan. This happened because service quality has increasingly been considered a key factor in the discrimination between service products and in building the competitive advantage. Customer satisfaction plays an important role in motivating consumers' behavioural loyalty, which translates into favourable feedback, repeated purchases, recommending the product or service to others and even into service innovation that would improve clients' experiences. In the case of the airlines industry, to survive the fierce competition, companies are required to effectively manage their passengers' relations so that they guarantee and retain customers' satisfaction, with the ultimate goal of driving future income. The same as in the other businesses, in the airline industry, the customers' needs and demands are usually affected by several factors, of which service quality remains the most significant aspect. A crisis, such as the COVID-19, may lead to radical changes in the passengers' experiences and expectations. Thus, not only it is important to understand how passengers evaluate airlines, but also to identify which dimensions of satisfaction are the most important for the passengers in the context of the current pandemic. Therefore, the purpose of the present study is to investigate the differences in customers' satisfaction between the European low-cost and traditional carriers, during the COVID-19 period, as well the factors that influence their satisfaction. The empirical analysis was conducted on secondary data, consisting in 3,125 reviews written by passengers on well-known airline reviews websites.

Keywords: *Coronavirus pandemic; passengers' satisfaction; low-cost carriers; traditional airlines.*

JEL Classification: L93, D12

1. INTRODUCTION

As the COVID-19 crisis spread, all countries have been influenced not only from the health-care perspective, but also from the social, political, and

especially economic points of view. The airline industry was, however, among the worst affected due to the imposed travelling restrictions and to the fact that pandemic significantly changed consumers' habits and behaviours. Even though the airline industry has faced numerous challenges throughout history, none of them had such a magnitude and so serious consequences as the current pandemic.

The airline industry's fierce competitiveness needs efficient customer relations management to retain passenger satisfaction and to generate future revenues (Sezgen, Mason and Mayer, 2019). Since service quality has increasingly been considered a key factor in the discrimination between service products and in building the competitive advantage, this aspect has been integrated as a major component in any business's strategic plan. Satisfied customers will become more loyal, fact that translates into favourable feedback, repeated purchases or recommending the product / service to others (Lucini *et al.*, 2020). On contrary, unsatisfied passengers might not fly with the same airline again in the future (Namukasa, 2013), or they may launch a negative word-of-mouth campaign with a negative impact on company's credibility and image (Blodgett and Li, 2007). Therefore, customers' satisfaction has an additional impact on the individuals' perception of the airlines, namely corporate image (Calisir, Basak and Calisir, 2016).

It was noticed that customer feedback plays a crucial role not only for business growth and performance, but also for product and service innovation and for improving customers' experience (Siering, Deokar and Janze, 2018). This is the reason why it is important to understand how passengers evaluate the airlines and to identify which dimensions of satisfaction are the most important for them (Park, Robertson and Wu, 2004).

In the current context, strongly influenced by the COVID-19 pandemic, big data has become a valuable resource that allows companies to better understand the behaviour of their customers (Sternberg *et al.*, 2018). Therefore, websites like TripAdvisor or Sktyrax, which focus on gathering the online reviews from restaurants, hotels and, more recently, airlines, are an important source of data (Rane and Kumar, 2018). These websites, which receive over one million monthly visitors, allow comment texts and rating scores provided by the passengers (Messner, 2020).

Considering all these aspects, the purpose of the present study is to investigate the differences in customers' satisfaction between the European low-cost and traditional carriers, during the COVID-19 period, as well the factors that influence their satisfaction. The empirical analysis was conducted on secondary data, consisting in 3,125 reviews written by passengers on well-known airline reviews websites. The rest of the research is structured on four parts: a brief presentation of the theoretical aspects is included in section two,

part three shows the methodological approach, the results and discussions are presented in section four and the last part concludes.

2. LITERATURE REVIEW

The COVID-19 pandemic generated a huge loss for the tourism industry, amounting to \$935 billion only in the first 10 months of 2020 (Madden, 2021). In this context, the aviation industry suffered a significant decline. According to the statistics, in 2020, the decrease of 2.699 billion passengers caused a total airline revenue loss of \$371 billion (International Civil Aviation Organization, 2021). In addition to the introduction of the traveling restrictions or mandatory quarantine (Poonam, 2020), tourists became more concerned about their health and started to limit their trips (Villace-Molinero *et al.*, 2021). Indeed, the pandemic led to significant changes in consumers' habits and behaviour, mostly because of confinement-related problems (Jafari *et al.*, 2020). Many travellers who had planned to travel overseas were cancelling or postponing their vacations (Nilashi *et al.*, 2021).

Since the impact of the COVID-19 is expected to persist until 2024 (IATA, 2020), the pandemic seems to be one of the most dangerous crisis to the airline sector in the entire history. Gudmundsson, Cattaneo and Redondi, (2021) shaped a more pessimistic scenario, forecasting a recovery path only in 2026. Several studies tried to identify the COVID-19's influence on the worldwide aviation sector. Dube, Nhamo and Chikodzi, (2021) noticed that various airlines and airports significantly diminished their activity or even went bankrupt because of the high cash burn caused by the travel restrictions. According to a study conducted by Liu, Kim and O'Connell, (2021) in Europe almost 795,000 flights were cancelled during the shutdown periods between 2020 and 2021.

In this difficult global climate, it is very important that the airlines make their customers loyal on the long run, by offering quality services that could increase their satisfaction. Customers' satisfaction, very important for highly competitive businesses such as airlines, can be attained only when the needs and preferences of customers are adequately met and prioritized by the company (Khudhair *et al.*, 2019). However, several studies consider that it is difficult to achieve and hold customer satisfaction in the airline industry because it is influenced by multiple dimensions, such as baggage handling, as well as pre-flight, in-flight and post-flight services (Archana and Subha, 2012). Yet, Saha and Theingi (2009), conducting a SERVQUAL-based study on passengers of three low-cost airlines from Thailand, found that service quality was a significant determinant of customer satisfaction. The most relevant aspects mentioned by the customers were schedule, tangibles, flight and ground staff. In South Korea, tangibles and responsiveness were found to be the most significant service quality issues that increased customer satisfaction and their loyalty for the low-cost carriers (Kim and Lee, 2011). Moreover, Yunus, Bojei and Rashid,

(2013) noticed that different service quality aspects had significant effects on customers' loyalty, which, in turn, was mediated by the emergence of customer satisfaction.

Various scholars proposed different aspects to evaluate the quality of service provided by airlines. For example, Aksoy, Atilgan and Akinci, (2003) mentioned nine aspects of the airlines' service quality: personnel, food and beverage service, Internet services, cabin features, country of origin and promotion, in-flight activities, speed, punctuality and aircraft. Hussain, Al Nasser, and Hussain, (2015) categorized service quality into six dimensions: reliability, responsiveness, assurance, tangibles, security and safety, and communication.

Traditionally, the quality of the services was measured by using the SERVQUAL analysis (Chou *et al.*, 2011). However, to assess the quality of the airlines' services, Ekiz, Hussain and Bavik, (2006) particularized this analysis and called it AIRQUAL. It consists of five aspects: airline tangibles (the facilities and equipment inside the aircraft), terminals tangibles, personnel service (quality of the service delivered by the airlines' staff), empathy, defined as the firm's ability and willingness to offer individual care and service to each customer (Leong *et al.*, 2015) and airline's image (general perception of an airline's brand). During time, several other aspects have been added to this analysis, such as: safety (Calisir, Basak and Calisir, 2016), flight schedule (Chen and Chao, 2015) or quality of booking and ticketing services (Shaw, 2007).

According to Oliver (1999), customers' satisfaction can be described as a pleasurable fulfilment, which is a measure of how a service provided by a company meets or surpasses customers' expectations. In this way, the customer considers that the consumption of that service fulfils some desires, needs or goals. Moreover, an increase in customers' satisfaction should lead to greater customer retention and loyalty (Abdullah *et al.*, 2011). In the context of the current pandemic, many airlines struggled to survive and, thus, to increase customers' satisfaction and loyalty through the services they offered (Xuesong *et al.*, 2021).

While numerous research has been undertaken to study customers' satisfaction using surveys and online passenger ratings, the effect of COVID-19 on passenger satisfaction has not been explored. Considering all these aspects, we consider that is vital to assess satisfaction indicators gathered from online consumer reviews to ascertain consumers' preferences for airline services during the COVID-19 pandemic. Based on the previous studies' results, we launch the following research hypotheses:

H1. During the COVID-19 pandemic, the factors that influenced the satisfaction of European airlines' customers have changed.

H2. The satisfaction of European airlines' customers and the factors that influenced it were different for the low-cost versus the tradition carriers during COVID-19.

3. RESEARCH METHODOLOGY AND DATA

Using an empirical approach based on the secondary data investigation, we analysed the differences in customers' satisfaction between the European low-cost and traditional carriers, during the COVID-19 period, as well as the factors that influence their satisfaction. To see if the factors that influenced the satisfaction of European airlines' customers have changed during the pandemic, the analysed period was 2017-2021.

The sample of this study consists in a dataset with 3,125 reviews written by passengers on the well-known airline reviews website, airlinequality.com. This is one of the top review sites for airlines, airports, and associated air travel reviews, owned by Skytrax, a brand that is recognizable for its Airline and Airport Star Rating, the World Airline Awards and Airport Awards (Skytrax, 2021a). This review site is an independent customer forum, with no financial association with any of the airlines or airports featured. In 2020, Skytrax conducted the world's only assessment and certification of the health and safety measures taken by the airlines during the pandemic (Skytrax, 2021b).

The website allows comment texts and a 0 to 10 rating score provided by the passengers. Our sample was focused only on the persons that travelled with European low-cost or traditional carriers.

The reviews were analysed with a sentiment analysis tool that was customized for the aviation industry. Sentiment analysis is an analytic method of big data that identifies the polarity of sentiment in expressions or judgments made by consumers (Nasukawa and Yi, 2003). As a research tool, we used in this study the dictionary-based approach, which relies on a dictionary containing words and phrases that have attributed scores ranging from +1 (strongly positive) to -1 (strongly negative).

4. RESULTS AND DISCUSSIONS

Before analysing the data, we noticed that most passengers who wrote reviews travelled with low-cost airlines, both before and during COVID-19 period (see Table 1).

Table 1. Proportion of passengers who wrote reviews, by type of airline, before and during pandemic

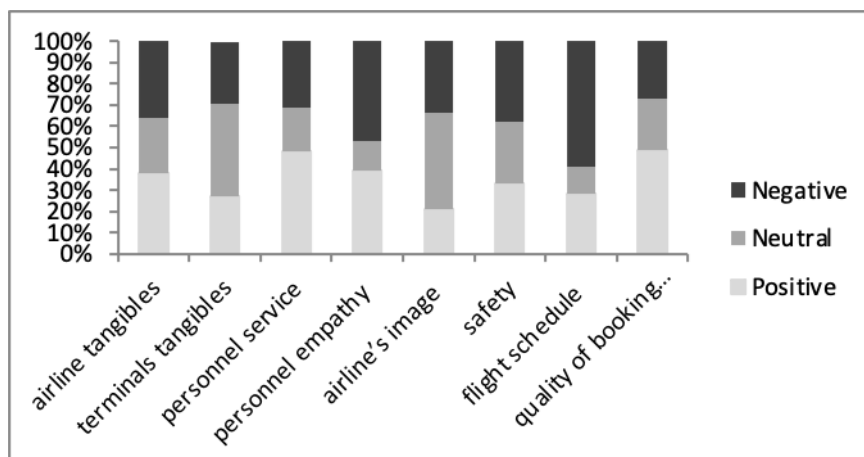
Type of airline	Pre-COVID-19 period	COVID-19 period
Traditional	31.58%	40.87%
Low-cost	68.42 %	59.13%

Source: own results

Regarding the pre-COVID-19 period, we noticed that, from the 3,125 analysed reviews, 26.38% were classified as positive, 21.46% as neutral and 52.16% as negative. This means that more than half of the reviews from Skytrax website written between 2017 and 2020 are complaints regarding the airlines' services. One interesting aspect is that a large majority of the negative reviews reflected travellers' disappointment by the services offered by the low-cost carriers.

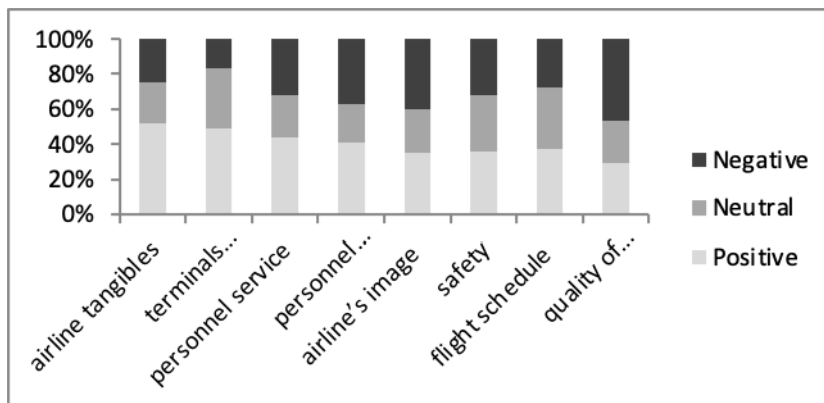
Considering the aspects included in the AIRQUAL analysis – airline tangibles, terminals tangibles, quality of the service delivered by the airlines' staff, personnel empathy and airline's image – together with some other elements such as safety, flight schedule and quality of booking and ticketing services, we tried to identify the factors that influenced passengers' satisfaction before the pandemic. In the case of the low-cost airlines, the quality of booking and ticketing services as well as the quality of the service delivered by the airlines' staff were the aspects that satisfied the most the travellers (see Figure 1). Meanwhile, the flights' schedule was the aspect that dissatisfied the most the low-cost passengers before the pandemic.

Figure 1. Factors that influenced the satisfaction of the low-cost airlines' travellers before COVID-19



Source: own results

As it results from Figure 2, before the pandemic, the passengers of the traditional airlines were mostly satisfied by the airlines and terminals' tangibles and mostly dissatisfied by the quality of booking and ticketing services. However, a large part of these travellers consider that the quality of the services delivered by the airlines' staff and the personnel's empathy have a great impact on the satisfaction they perceive when they use the services of the traditional carriers.

Figure 2. Factors that influenced the satisfaction of the traditional airlines' travellers before COVID-19

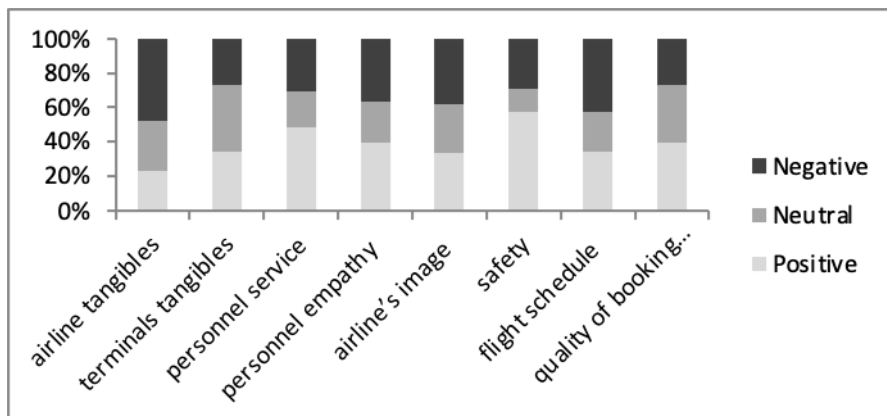
Source: own results

Starting from March 2020, all the COVID-19 restrictions worsened the traveling experience, fact that explains the increased number of negative reviews. During the period 2020-2021, among all the reviews, only 19.56% were positive, 18.2% were neutral and 62.24% were negative. This time, most of the complaints were focused on the traditional carriers' services. This change can be explained through the fact that these airlines have suspended most of their routes, compared to the low-cost airlines which had a lower number of flights that were cancelled.

Regarding the factors that influenced the travellers' satisfaction after the COVID-19 outbreak, we notice that, in case of both low-cost and traditional airlines, the quality of the services delivered by the airlines' staff and the safety were the aspects that had the highest positive impact (see Figures 3 and 4). This aspect is not a surprise since several studies mentioned that the airport staff and cabin crew are some of the factors with the largest influence on passengers' satisfaction (Lucini *et al.*, 2020; Song, Guo and Zhuang, 2020).

Therefore, passenger satisfaction varies proportionally with the performance of this attribute. Meanwhile, the diminished serviced offered on-board made the airlines' tangibles be the factor that mostly dissatisfied the travellers in times of pandemic. This was a factor of discontent especially in the case of the longer flights, during which the passengers could not buy even food products.

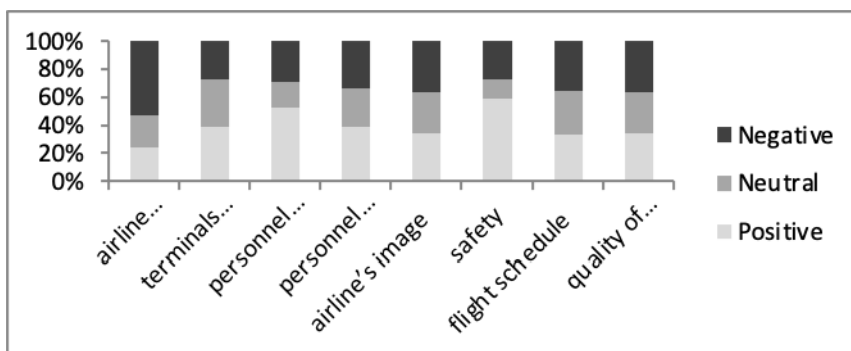
Figure 3. Factors that influenced the satisfaction of the low-cost airlines' travellers during COVID-19



Source: own results

Considering these results, we accept our first research hypothesis *H1*. *During the COVID-19 pandemic, the factors that influenced the satisfaction of European airlines' customers have changed.* If before pandemic the aspects that satisfied the most the travellers were the quality of booking and ticketing services and the quality of the service delivered by the airlines' staff, for the low-cost airlines, and the airlines and terminals' tangibles, in the case of the traditional carriers, after the outbreak most of the travellers became preoccupied by the quality of the service delivered by the airlines' staff and the safety.

Figure 4. Factors that influenced the satisfaction of the traditional airlines' travellers during COVID-19



Source: own results

Meanwhile, since the factors that influenced the satisfaction of the European airlines' passengers were the same for the low-cost and traditional carriers during the COVID-19, but more travellers were dissatisfied with the

quality of the services they received from the traditional airlines than from the low-cost transporters, the second hypothesis is only partly accepted: *H2. The satisfaction of European airlines' customers and the factors that influenced it were different for the low-cost versus the tradition carriers during COVID-19.*

5. CONCLUSIONS

This research analysed the reviews written by airlines' passengers with the help of sentiment analysis, a well-established text mining technique able to extract information hidden in unstructured text. As intended from the very beginning, we found the differences in customers' satisfaction between the European low-cost and traditional carriers, during the COVID-19 period, as well as the factors that influence their satisfaction. Moreover, we noticed that the factors that influenced the satisfaction of European airlines' customers have changed during the pandemic.

According to our findings, even before the pandemic many passengers were unhappy with the services offered by the airlines, their expectations not being met. A large majority of the negative reviews dating before COVID-19 reflected travellers' disappointment regarding the services of the low-cost carriers. The disappointment of the airlines' services aggravated even more during the pandemic, the negative reviews increasing since March 2020. However, this time, most of the complaints were focused on the traditional carriers' services.

Our results suggest that the quality of booking and ticketing services and the quality of the services delivered by the airlines' staff were the aspects that satisfied the most the low-cost airlines' travellers. Meanwhile, the traditional carriers' travellers were mostly satisfied by the airlines and terminals' tangibles. Yet, after the COVID-19 outbreak, most of the travellers became preoccupied by the quality of the service delivered by the airlines' staff and their safety. Therefore, we notice that the factors that influenced the satisfaction of the European airlines' passengers were the same for the low-cost and traditional carriers during the pandemic. However, in the context of the health crisis, more travellers were dissatisfied by the services they received from the traditional airlines than from the low-cost transporters. Considering these aspects, we fully accept the first research hypothesis and only partly accept the second one.

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GREEN FINANCE AND ECONOMIC GROWTH IN THE POST COVID-19 WORLD. EVIDENCE FROM EU COUNTRIES

ADINA DORNEAN

*Alexandru Ioan Cuza University of Iași
Iași, Romania
amartin@uaic.ro*

ADA-IULIANA POPESCU

*Alexandru Ioan Cuza University of Iași
Iași, Romania
ada.popescu@uaic.ro*

DUMITRU-CRISTIAN OANE

*Flex Financial IFN
Bucharest, Romania
oanea.cristian@gmail.com*

Abstract

The importance of green finance has been steadily growing over the last years and it became a necessity for sustainable development of our society. According to the literature, green finance simultaneously provides economic growth and environmental protection.

In 2020, the COVID-19 crisis generated the need for a friendlier environmental development that put a greater emphasis on green finance as an economic instrument in order to achieve it. Considering the role of green finance in obtaining an inclusive, resilient and cleaner economic growth through environmental protection, the present paper empirically analyses the link between green finance and economic growth. For this purpose, we will use a multiple linear regression based on balanced panel data for the European Union (EU) countries. The results show that green finance has a positive impact on economic growth. Therefore, governments and policymakers should focus on financing green projects and even promote green fiscal policies, that can contribute to the global green recovery after the COVID-19 pandemic.

Keywords: *green finance; COVID-19; economic growth; environmental protection; sustainable development.*

JEL Classification: O11, O47, Q01, Q56

1. INTRODUCTION

The COVID-19 pandemic hit all the countries around the world and affected their economies and their economic growth. According to the International Monetary Fund (IMF, 2020a), in the first six months of 2020, the

COVID-19 pandemic has had a more negative impact on activity than anticipated, and the recovery was projected to be more gradual than previously forecast. Thus, in 2021, global growth was projected at 5.4 percent. In this context, the European Union has proposed an additional €750 billion (in 2018 prices, representing 6% of GDP in support over the period 2021–2027, through NextGenerationEU (European Commission, 2021a), including a grant-based recovery fund (The Recovery and Resilience Facility). The recovery plan for Europe, presented by the European Commission on 27 May 2020 and approved on 21 July 2020 by EU leaders, promotes green recovery and reduces the uneven impact of the pandemic on Member States' debt sustainability.

Therefore, at EU level, the European Commission (2021b) forecasted that GDP will grow by 4.8% in 2021 and 4.5% in 2022 in both the EU and the euro area. An important aspect to highlight is that the European Commission predicted that the volume of output will return to its pre-crisis level (2019-Q4) in the last quarter of 2021, which is one quarter earlier than expected.

The most recent projections of IMF (2022, p. 16), which considers the war in Ukraine, noted that “global growth is projected to slow from an estimated 6.1 percent in 2021 to 3.6 percent in 2022 and 2023”. This means 0.8 and 0.2 percentage points lower for 2022 and 2023 than projected in January 2022.

In the case of EU countries, at the beginning of 2022, the pandemic situation was improving and the EU economy was in a robust expansionary phase. But, the war in Ukraine determined European Commission (2022) to adjust its predictions regarding the EU economic growth at 2.7% in 2022 and 2.3% in 2023.

Of course, the impact of COVID-19 on economic growth was different across countries and the recovery varied significantly, depending on access to medical services, effectiveness of policy support, exposure to cross-country spill overs, and structural characteristics entering the sanitary crisis.

A positive aspect from the COVID-19 consisted in a record drop in greenhouse gas emissions during the pandemic (IMF, 2020a). Now, policymakers should accelerate the transition to lower carbon dependence by pushing green investments coupled with initially moderate but steadily rising carbon prices, which would yield needed emissions reductions while supporting the recovery from the pandemic recession (IMF, 2020b).

This study is an attempt to understand the role of green financing for economic growth during the pandemic. The study contributes to the literature by investigating the potential role of green finance in achieving sustainable recovery from COVID-19, giving insights of how green finance could expedite economic growth for the EU countries.

The structure of the paper is as follows: section 2 reviews the existing literature regarding the role of green finance in general, but also the relationship between green finance and economic growth in order to ensure sustainable

development. Section 3 outlines the research objective and hypotheses and section 4 presents the methodology and the data used. Section 5 shows the results and discusses the most important findings. Finally, section 6 concludes and highlights the policy implications in accordance with these findings.

2. GREEN FINANCE AND ECONOMIC GROWTH: A BRIEF LITERATURE REVIEW

Our previous research (Popescu and Dornean, 2020; Dornean and Popescu, 2021) focused on green finance, as part of the sustainable finance strategy, which can improve environmental protection and also highlighted the evolution of green finance during COVID-19 pandemic. Our results showed that, in recent years, some countries registered economic growth while reducing gas emissions, which supports the idea that policy makers should continue to follow their medium and long-term green finance strategies and abandon fossil fuel investments in favour of green ones.

The literature agrees with the fact that green finance could enhance economic growth and namely green growth that represents a practical tool for achieving the objective of sustainable development (Sachs *et al.*, 2019; Cigu, 2020; Zhou, Tang and Zhang, 2020; Dogaru, 2021; Yin and Xu, 2022).

In their paper, Sachs *et al.* (2019) arrived to the conclusion that if we want to achieve sustainable development goals, we need to open a new file for green projects and scale up the financing of investments that provide environmental benefits, through new financial instruments and new policies, such as green bonds, green banks, carbon market instruments, fiscal policy, green central banking, financial technologies, community-based green funds, etc., which are collectively known as “green finance”.

The same idea is shared by Zhou, Tang and Zhang (2020) that concentrate their study on the goal of green finance to pursue the coordinated development of financial activities, environmental protection, and at the same time ecological balance. For this purpose, they used the global principal component analysis (GPCA) method to construct a green finance development index for various provinces and municipalities in China between 2010 and 2017. The results obtained by Zhou, Tang and Zhang (2020) confirmed the hypothesis that green finance has a positive effect on environment improvement, even though these results vary for different levels of economic development. Regarding the impact of green finance on the relationship between economic development and environmental quality, Zhou, Tang and Zhang (2020) demonstrated that green finance can significantly improve this relationship, creating a win-win situation regarding economic development and the environment.

Moreover, Dogaru (2021) considered that the co-existence of three green ideas (green economy, green growth and sustainable development) is reasonable due to the complementary and simultaneous nature of these concepts. In the

context of COVID-19 pandemic, the concept of green growth is often used to describe those national, regional or international strategies that promote economic recovery from the coronavirus recession.

Yin and Xu (2022) conducted an empirical study of the coupling and coordinative development of China's green finance and economic growth during the period 2008-2020. Using a coupling coordination degree model, Yin and Xu (2022) found that green finance composite index and economic growth composite index have been improved, and the composite indexes of the two systems have obvious synergy. However, China's green finance composite index has been lower than the economic growth composite index, green finance laggings behind economic growth. In addition, the coupling and coordination degree between China's green finance and economic growth is not high. The results indicated that China's green finance needs to be strengthened.

Moreover, in the context of COVID-19, researchers agree that green financing could hasten recovery from socio-economic disruptions of COVID-19 if concerted policy actions and the various proposed global recovery packages that prioritizes green policy choices are implemented (Angom, 2021; Cojoianu, Andreas and Fabiola, 2021; Espinosa, Alonso Neira and Soto, 2021; O'Callaghan and Murdock, 2021; Singh and Mishra, 2022).

Angom (2021) conducted a non-systematic review between December 2020 and February 2021 through which examined peer-reviewed articles and reports on the role of green finance in obtaining sustainable recovery from COVID-19 and achieving the Sustainable Development Goals (SDGs). The conclusions of the study revealed that green financing has the potential to expedite sustainable development. This could be possible whereas governments implemented stimulus packages to help green recovery from COVID-19 and companies and institutions collaborated between them and with governments to ensure that green stimulus measures had the expected results. The same conclusion was shared by Espinosa, Alonso Neira and Soto (2021) that highlighted the fact that there is a growing need for a healthy and sustainable economic growth and development model in the post-COVID-19 world. Moreover, they identified entrepreneurship's creative and coordinating elements as the driving force behind sustainable economic growth and development.

Reviewing the literature, we found that there are several studies focused on sustainable development and economic growth, but very few examined the impact of green finance on economic growth and even less in the context of the COVID-19 pandemic. One of these studies is that of Singh and Mishra (2022). Using a sample of 30 countries from high-, upper middle-, lower middle-, and lower-income economies, Singh and Mishra (2022) applied ordinary least squares (OLS) and a robust regression method to estimate the impact of green financing on economic growth and they obtained a positive impact, result which

can be useful for policy-makers and governments that should focus on green project financing by integrating it into economic recovery plans.

Therefore, green financing is compatible with both the climate goals and the low emissions transition agenda. In support of this idea, the report of O’Callaghan and Murdock (2021) analyzed over 3500 fiscal policies announced by leading economies in 2020 and called for governments to invest more sustainably and tackle inequalities as they stimulate growth in the wake of the devastation wrought by the pandemic. Their study conducted to the conclusion that green spending policies often bring positive health outcomes through air pollution reduction and can reduce energy prices for targeted groups; in both cases, the positive impacts are most keenly felt by vulnerable populations. Despite positive fiscal steps towards a sustainable COVID-19 recovery from a few leading nations, the world has so far fallen short of matching widespread aspirations to “build back better” (O’Callaghan and Murdock, 2021, p. 40) with action.

3. RESEARCH AIM AND HYPOTHESES

In this context and starting from our previous research in the field (Popescu and Dornean, 2020; Dornean and Popescu, 2021), we proposed to contribute to a better analysis of green finance, especially on its link to sustainable development by using a quantitative model that comprise not only normal periods of time (as in our previous analysis), but also crisis periods, such as COVID-19 one and even the period after it.

The aim of the present paper is to analyse the economic impact of funding allocated to recovery measures having positive environmental impact. The present paper analyses 2021 macroeconomic data for 22 selected EU countries, in order to identify the extent to which the green spending had a positive or negative impact on economic growth.

Considering the literature on green finance and its role in sustainable development, analysed in the previous section, we assume that the sustainable development can be achieved through green finance. Therefore, our research hypotheses are:

H1: Green finance has a positive impact on economic growth.

H2: Green finance has a negative impact on economic growth.

4. METHODOLOGY AND DATA

4.1. Sample

In order to achieve our purpose, we have selected all the EU countries for which we were able to find data related to funding allocated to recovery measures which had a positive environmental impact. Based on OECD Green Recovery Database (2022), as we can see in table 1, from 27 EU countries, we

removed five EU Member States from our analysis, namely: Bulgaria, Croatia, Cyprus, Malta and Romania, due to lack of data availability.

Table 1. Funding allocated to recovery measures for EU countries

Country	Funding allocated to recovery measures having positive environmental impact - USD Billion	Included into analysis
Austria	4.40	YES
Belgium	4.36	YES
<i>Bulgaria</i>	-	<i>NO</i>
<i>Croatia</i>	-	<i>NO</i>
<i>Cyprus</i>	-	<i>NO</i>
Czechia	3.60	YES
Denmark	1.70	YES
Estonia	0.59	YES
Finland	2.88	YES
France	33.74	YES
Germany	64.60	YES
Greece	16.59	YES
Hungary	7.00	YES
Ireland	1.08	YES
Italy	120.77	YES
Latvia	0.93	YES
Lithuania	2.13	YES
Luxembourg	0.12	YES
<i>Malta</i>	-	<i>NO</i>
Netherlands	3.54	YES
Poland	30.22	YES
Portugal	9.59	YES
<i>Romania</i>	-	<i>NO</i>
Slovakia	2.81	YES
Slovenia	1.59	YES
Spain	38.35	YES
Sweden	7.21	YES

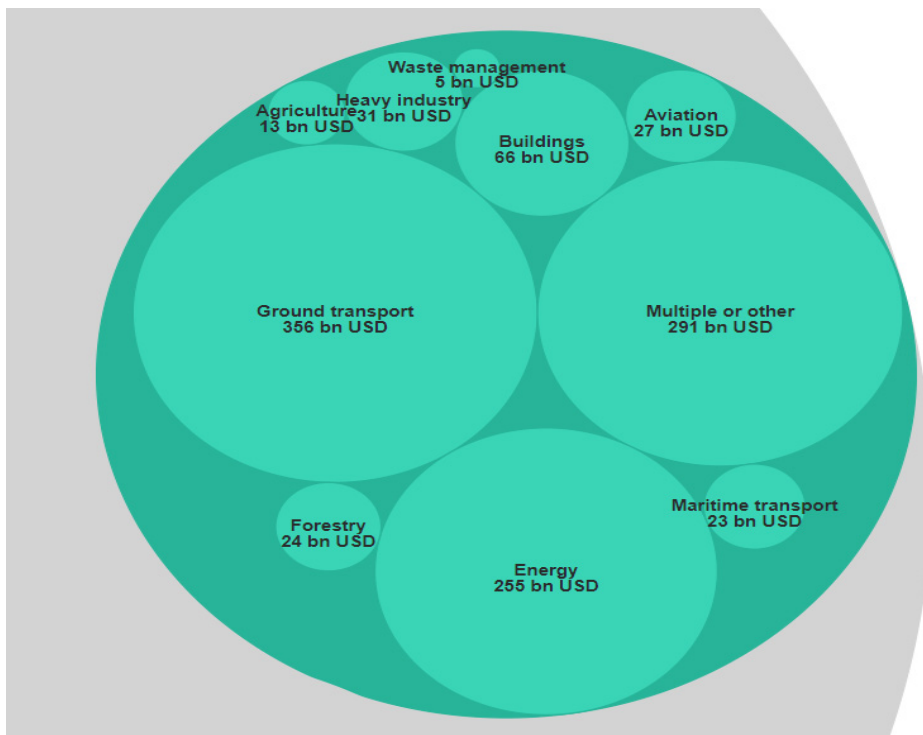
Source: authors' calculation, based on OECD Green Recovery Database (2022)

4.2. Model

Following the methodology used by Singh and Mishra (2022), we want to see if the green spending allocated for recovery from COVID-19 pandemic crisis had a significant impact on economic growth. For this purpose, we will use as dependent variable **GDP per capita**, which incorporates the economic performance of a country at individual level. This indicator is calculated as the ratio between Gross domestic product (GDP) defined as the value of all goods and services produced less the value of any goods or services used in their creation and population.

Due to the fact that we want to see the impact of green spending, we will use as main independent variable the value of funding allocated to recovery measures having positive environmental impact. According to figure 1, we are able to see that the main domains in which green spending had a positive environmental impact at world level are: ground transport (356 bn USD), energy (255 bn USD), buildings (66 bn USD), heavy industry (31 bn USD), aviation (27 bn USD), forestry (24 bn USD), maritime transport (23 bn USD), agriculture (13 bn USD), waste management (5 bn USD) and multiple or other (291 bn USD).

Figure 1. Funding allocated to recovery measures with positive impact



Source: (OECD Green Recovery Database, 2022)

Beside this, we will use four more macro-economic variables as independent variables, namely:

- **Inflation rate** - Harmonised Indices of Consumer Prices (HICPs) are designed for international comparisons of consumer price inflation;
- **Exports of goods and services** - The value of exports of goods and services divided by the GDP in current prices;
- **Gross fixed capital formation** - consists of resident producers' acquisitions, less disposals, of fixed assets during a given period plus certain additions to the value of non-produced assets generated by the productive activity of producer or institutional units.
- **General government gross debt** - total government consolidated gross debt at nominal value.

Based on the mentioned variable above, we will use as empirical model, the OLS (ordinary least squares) method. The model was adapted after Singh and Mishra (2022), as follows:

$$GDP_{capita_i} = \alpha + \beta_1 Green_i + \beta_2 Inflation_i + \beta_3 Exports_i + \beta_4 Capita_i + \beta_5 Debt_i + \varepsilon_i \quad (1)$$

4.3. Data and descriptive statistics

All data for macroeconomic variables were collected from EUROSTAT, for 2021, while the data for green spending were collected from OECD Green Recovery Database (2022). In Table 2, we present and define the variables used in our model.

Table 2. Description of variables used in the analysis

Variables	Used symbol	Unit of measure	The variable definition
DEPENDENT VARIABLE			
GDP per capita ^a	GDP_capita	GDP per capita	Gross domestic product (GDP) is a measure for the economic activity. It is defined as the value of all goods and services produced less the value of any goods or services used in their creation.
INDEPENDENT VARIABLES			
Funding allocated to recovery measures by positive environmental	Green	USD Billion	Measures related to COVID-19 economic recovery efforts with clear positive, negative or “mixed” environmental impacts across one or several

Variables	Used symbol	Unit of measure	The variable definition
impact ^b			environmental dimensions. For our purpose, we selected just clear positive environmental impacts.
Inflation rate ^a	Inflation	Annual average rate of change	Harmonized Indices of Consumer Prices (HICPs) are designed for international comparisons of consumer price inflation. HICP is used for example by the European Central Bank for monitoring of inflation in the Economic and Monetary Union and for the assessment of inflation convergence as required under Article 121 of the Treaty of Amsterdam.
Exports of goods and services ^a	Exports	Percentage of gross domestic product (GDP)	The value of exports of goods and services divided by the GDP in current prices
Gross fixed capital formation ^a	Capital	Percentage of gross domestic product (GDP)	Gross fixed capital formation (GFCF) consists of resident producers' acquisitions, less disposals, of fixed assets during a given period plus certain additions to the value of non-produced assets generated by the productive activity of producer or institutional units.
General government gross debt ^a	Debt	Percentage of gross domestic product (GDP)	Government debt is defined as the total consolidated gross debt at nominal value in the following categories of government liabilities (as defined in ESA 2010): currency and deposits (AF.2), debt securities (AF.3) and loans (AF.4).

Source: ^a – authors' calculation, based on EUROSTAT; ^b – authors' calculation, based on OECD Green Recovery Database (2022)

The descriptive statistics for selected variables are presented in Table 3 for the year 2021. Even if the mean green expenses are around 16 bn USD, the median is 3.98 bn USD, this mainly due to Italy for which we have the maximum value of 120 bn USD, being an outlier compared with the others. At

the same time, we can see that the average inflation is 2.9%, while the average debt is 75% from GDP. Despite this, we can see that the highest inflation rate is recorded in Hungary and Poland (Figure 4), while the highest debt is recorded in Greece and Italy (Figure 7).

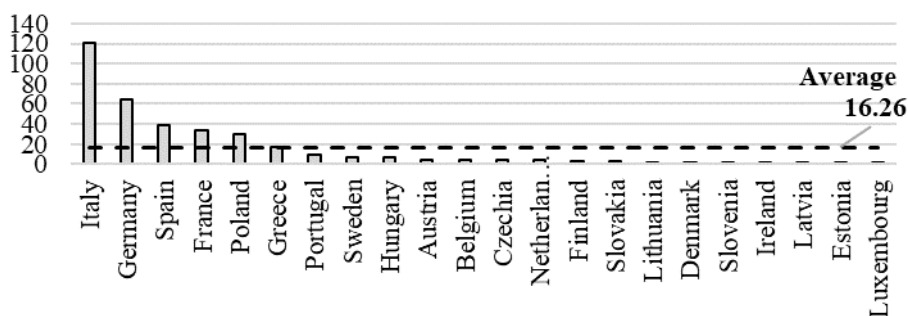
Table 3. Descriptive statistics

Variable	Mean	Median	Std. Dev.	Max.	Min.
Green (bn USD) ^b	16.26	3.98	27.82	120.77	0.12
GDP_capita (Purchasing Power Standards (PPS)) ^a	110.55	93.50	49.21	277.00	65.00
Inflation (%) ^a	2.9%	2.8%	0.01	5.2%	0.6%
Exports (% of GDP) ^a	70.9%	62.4%	0.39	212.1%	29.4%
Capital (% of GDP) ^a	21.99%	22.15%	0.04	28.60%	12.90%
Debt (% of GDP) ^a	75.1%	64.5%	0.43	193.3%	18.1%

Source: ^a – authors' calculation, based on EUROSTAT; ^b – authors' calculation, based on OECD Green Recovery Database (2022)

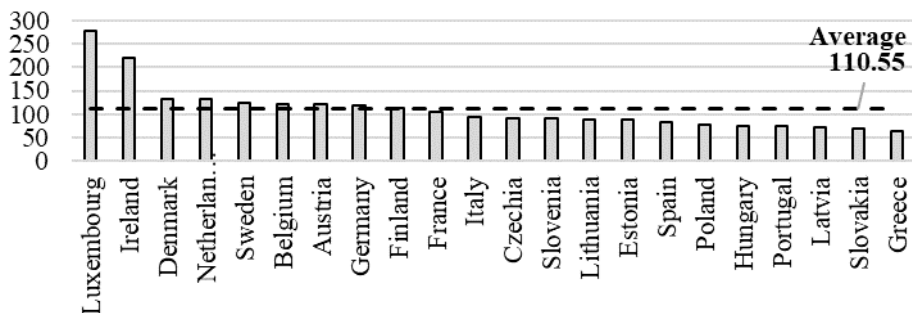
In order to see the distribution of each variable by country for year 2021, we present in Figures 2 – 7, the values for each country for each variable. Based on this, we notice that the highest green spending with positive impact were done in Italy (120 bn USD), while the lowest were done in Luxembourg (0.12 bn USD).

Figure 2. Funding allocated to recovery measures with positive impact (bn USD)



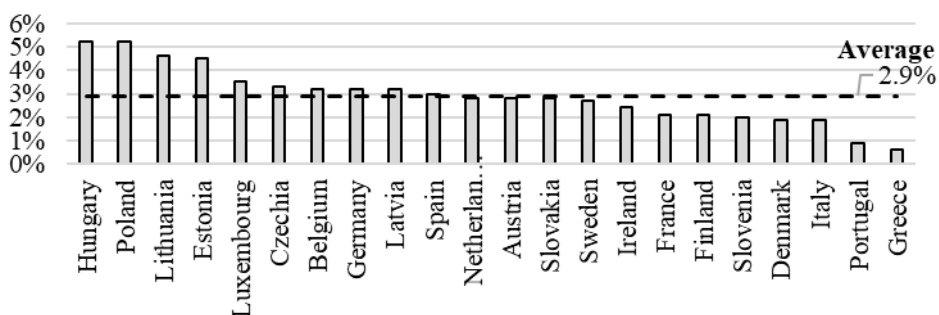
Source: authors' calculation, based on OECD Green Recovery Database (2022)

Figure 3. GDP per capita for selected countries in 2021 (PPS)



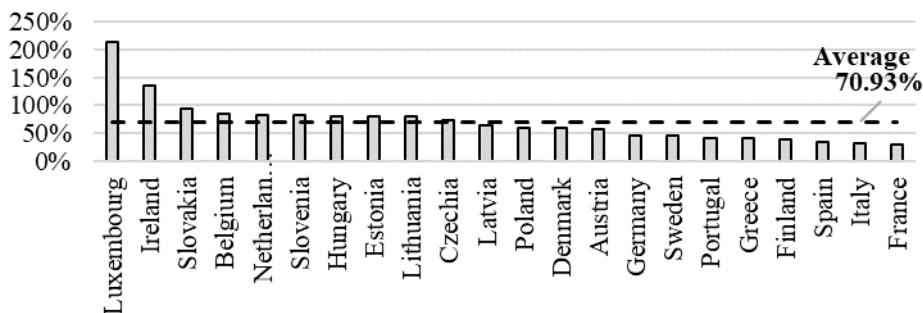
Source: authors' calculation, based on EUROSTAT database

Figure 4. Inflation rate for selected countries in 2021

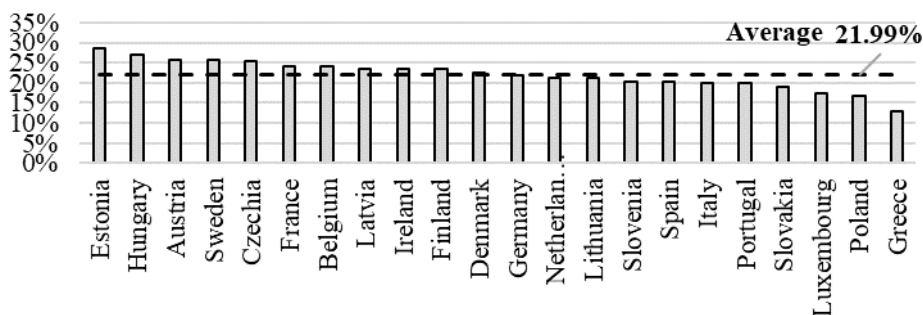


Source: authors' calculation, based on EUROSTAT database

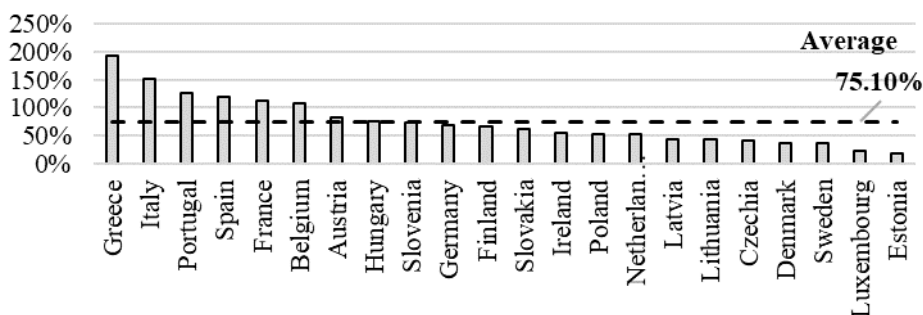
Figure 5. Exports for selected countries in 2021 (% of GDP)



Source: authors' calculation, based on EUROSTAT database

Figure 6. Capital formation for selected countries in 2021 (% of GDP)

Source: authors' calculation, based on EUROSTAT database

Figure 7. General government gross debt for selected countries in 2021 (% of GDP)

Source: authors' calculation, based on EUROSTAT database

Before starting to estimate the model, we apply the Augmented Dickey Fuller test to check if the series are stationary. Based on the results presented in Table 4 we can see that all variables except green spending are stationary. For this reason, we will use the logarithm series for green expenses, which seems to be stationary.

Table 4. Stationary test results - Augmented Dickey Fuller Test^a

Variable	H0: I(1)
Green (bn USD)	-1.54
Ln(Green)	-7.44*
GDP_capita (Purchasing Power Standards (PPS))	-5.88*
Inflation (%)	-4.30*
Exports (% of GDP)	-3.80*

Variable	H0: I(1)
Capital (% of GDP)	-4.56*
Debt (% of GDP)	-3.84*

^a -The 5 percent critical value for the Augmented Dickey Fuller statistic is -3.01

* - Indicates significant at the 0.01 level

Source: authors' calculation

Table 5. Correlation matrix for selected variables

	ln(Green)	Inflation	Exports	Capital	Debt
ln(Green)	1.0000				
Inflation	-0.1370	1.0000			
Exports	-0.4136	0.2975	1.0000		
Capital	-0.2252	0.3444	-0.0876	1.0000	
Debt	0.4049	-0.5820	-0.4024	-0.4158	1.0000

Source: authors' calculation

The strongest correlation of -0.5820, as is presented in table 5, it is recorded between the inflation rate and the general government gross debt (% as GDP). In order to prevent multicollinearity between independent variable, we will estimate different regression models, in order not include both of them in the same regression model.

5. RESULTS AND DISCUSSION

We will estimate two regression models: the first one in which we will include only inflation (Model 1) and the second model – Model 2, in which we will replace Inflation rate with Debt (% as GDP). The results are presented in Table 6.

As we can see from the results presented in Table 6, green spending with a positive environmental impact has a positive impact on economic growth, mainly estimated by GDP per capita.

Considering also the information from Figure 2, we are able to see that the greenest spending was done in Italy, as it was the worst affected EU country by COVID-19 pandemic. Even so, the GDP per capita for Italy is a bit under the EU average for 2021, which also confirms that the funding allocated to recovery measures having positive environmental impact had a positive impact on economic growth.

At the same time, we can see that the inflation rate has a negative impact on economic growth, measured by GDP per capita, similar to the results obtained in previous studies (Barro, 1995; Andres and Hernando, 1997; Barro, 2013; Singh and Mishra, 2022). The other independent variables included in our model,

namely debt, capital and exports have a positive impact on economic growth. In the case of debt, the results are in line with previous studies (Panizza and Presbitero, 2013), but only on short-term (Puonti, 2022), because on long-term the impact turns to be negative.

Table 6. Correlation matrix for selected variables

Variable	Model 1	Model 2
Constant	-66.9482 (59.2702)	-26.3346 (83.3520)
Ln(Green)	12.9649** (6.5246)	7.7020* (8.1104)
Exports	154.3578*** (27.8210)	121.0461*** (31.1530)
Capital	444.3259** (210.0763)	173.1324 (256.3020)
Inflation	-1737.7690** (613.4640)	
Debt		0.8126 (25.9414)
R-squared	0.7386	0.6153
F-test	12.0145	6.7998

a – (standard errors in parentheses)

*, **, *** - Indicates significant at the 0.1 level, 0.05 level and 0.01 level

Source: authors' calculations

Going further, the relative high value for R-squared in case of both models (0.73 – Model 1 and 0.61 – Model 2), show that economic growth is mainly impacted by the selected variables, in which it is included also the green spending for recovery from COVID-19 pandemic crisis. The results confirmed our first hypothesis and they are in line with the results obtained in previous studies (Angom, 2021; Espinosa, Alonso Neira and Soto, 2021; O'Callaghan and Murdock, 2021; Singh and Mishra, 2022).

6. CONCLUSIONS

In this paper, we empirically analysed the relationship that exist between green finance and economic growth for 22 EU countries. More specifically, we investigated if green spending for recovery from COVID pandemic crisis had a significant impact on economic growth. The results confirmed the first hypotheses and the positive impact of green spending on economic growth.

Since green finance has a significant positive impact on economic growth, we subscribe to the proposal of Yin and Xu (2022) that “financial institutions should actively support green finance policies, vigorously develop green finance

business, increase investment in green and new energy industries, and improve the efficiency of green finance fund allocation”. Apart from these suggestions, we recommend also the involvement of all public authorities and the private entities as being necessary. Therefore, the government can adopt tax incentives on green bonds to attract investors; it can also reduce the loan interest rate of green loans as much as possible; and the government can encourage the development of various green investment funds such as green investment funds in the public-private partnerships.

The present study presents some limitations due to data unavailability for all EU countries. Thus, further research can extend the analysis to all EU countries, and we propose to use as indicator “Expenditure on environmental protection by institutional sector” (as % of GDP), a Eurostat indicator which measures the economic resources devoted to prevention, reduction, and elimination of pollution and any other degradation of the environment done by corporations, households, general government, but also at the level of economy as a whole. At the moment, the data is available only until 2021 (at EU level) and until 2019 (at country level). Other possibility, if we want to analyze only the government contribution to green spending, is to use “government expenditure on environmental protection” as indicator, which is available only until 2020. After the new data will be published, we can improve our analysis, by including data post-COVID-19.

Even so, our paper contributes to the literature by investigating the contribution of green finance to economic growth, comparing data from 22 EU countries.

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EMISSIONS REDUCTION IN THE FLEET OF EUROPEAN ORIGINAL EQUIPMENT MANUFACTURERS BASED ON THE “NEW EUROPEAN DRIVING CYCLE”

STEPHAN FILSER

Alexandru Ioan Cuza University of Iași

Iași, Romania

stephan.filser@outlook.com

Abstract

The analysis of CO₂ (CO₂) emissions in the automotive industry is divided into three main phases, the production phase, the use phase, and the end-of-life phase. During the production phase and the end-of-life phase the CO₂ emissions are caused through several process steps in manufacturing and recycling. For the measurement of CO₂ emissions during the use phase (“in the fleet”) the NEDC (New European Driving Cycle) was developed and introduced by the European Union (last update in 1997). To establish a status of the progress of the reduction of CO₂ emissions in the fleet in the automotive industry in Europe, an analysis of published annual reports as well as sustainability reports of the year 2020 by chosen OEMs (original equipment manufacturer) is carried out. The usability of data is subordinated to the group structures of the OEMs and the availability of corresponding reports. While the WLTP (worldwide harmonised light-duty vehicles test procedure) had already been introduced in 2014, useable data is still mainly based on the NEDC. Since 1995, OEMs have shown an (realistic) average annual improvement of the reduction of CO₂ emissions in their fleets of 2.27 %. Relative to the reductions already achieved, zero emissions could be reached between 2036 (best-case scenario) and 2042 (worst-case scenario). In 2019 a new regulation by the European Parliament (EU 2019/631) came into effect, recommending the WLTP. A poll of the European Parliament in June 2022 set another goal of zero CO₂ emissions in the fleet by 2035. According to the current analysis this goal is equivalent to an annual improvement of CO₂ emissions in the fleet of 4.21 % - more than 1.5 times higher than the calculated average.

Keywords: CO₂ emissions in the fleet; automotive industry; NEDC; WLTP.

JEL Classification: D22, L62, P18, Q55

1. INTRODUCTION

The discussion about greenhouse gases and their negative effects to the environment is already about half a century old but had never been so prevailing. While whole branches are still struggling to reach latest emission goals, governments and collaborative associations like the European Union had already released new regulations which again contain new and harder goals. Since the Paris Agreement in 2015 (United Nations, 2015) several regulations have been

published and reworked by the European Union regarding the limitation of CO₂ emissions.

In general, all branches are affected by the need of measures to decrease the emissions of greenhouse gases and especially CO₂. The highest rate of greenhouse gas emissions comes from the need of energy in its different forms, especially electricity and heat. At least 11,9% of the greenhouse gas emissions are affected by transportation (Ritchie, Roser and Rosado, 2020).

Another sub-sector in transportation is commercial vehicles. The measurement of CO₂ emissions is done in three main phases: production phase, use phase, and end of life. During the use phase the value of interest is the CO₂ emission in the fleet. This phrase remains in a measurement of the CO₂ emissions of every type of vehicle in the fleet of an OEM and a calculation of the average CO₂ emission of the fleet. The measurement standard for CO₂ emissions in the fleet in the European Union “NEDC” (New European Driving Cycle) got overworked several times (European Communities, 1970; European Parliament and Council, 2007) and got replaced in 2018 by the Worldwide Harmonized Light Vehicles Test Procedure “WLTP” (European Parliament and Council, 2019).

Moreover, the European Union also gives very ambitious goals for emission limits. Limit of 95 grams per kilometre CO₂ by 2030 and 0 grams per kilometre CO₂ by 2035 are set (European Parliament, 2022).

2. RESEARCH METHODOLOGY, METHODS, AND DATA COLLECTION

The purpose of this paper is to give an overview of the current improvement status according to the CO₂ emissions, focusing European OEMs in the automotive industry. The analysis shall show the current states of CO₂ emissions reduction in the fleet, a comparison of the states of the OEMs, and a forecast according to the average annual improvement, targeting zero emissions by 2035 and emissions of 95 g CO₂/km by 2030. Therefore, the paper follows a realistic philosophy and an inductive approach.

Only secondary data is used in this paper. The value of interest is the average fleet CO₂ emissions per kilometre in grams. The level of analysis depends on the individual data transparency and the scope of the data. The average annual percentual reduction of CO₂ emissions are calculated to make the effects visible and a calculation of the forecast possible.

Interpretations about the calculated values are done if applicable. Accordingly, the paper corresponds to archival research in a descriptive manner. The central question of this work is: how long would it theoretically last to reach zero CO₂ emissions in the lifecycle of passenger vehicles during the use phase according to current published fleet CO₂ emissions? The scope is defined over a stakeholder analysis and the availability of corresponding reports of the OEMs.

3. ANALYSIS AND RESULTS

A stakeholder analysis is carried out beforehand to enable a specific data collection targeting “NEDC” and “WLTP” values. In sum, 57 European OEMs are found and approved over different data bases (Zenger, 2022; Borst, 2022). To decomplicate the efforts and to ensure an efficient progress, group constellations and affiliations are considered. This separation is done through the websites of the OEMs. 25 OEMs contain to a company group, so there are 32 OEMs or groups left to be considered.

The data collection is done over annual (financial) reports and sustainability reports of the year 2020, published by the selected OEMs on their websites, whereby only 5 OEMs publish usable data of interest. To ensure the comparability NEDC values are converted to WLTP values. A conversion factor of 1.2 is used (Tsikmakis *et al.*, 2017).

3.1. Collected data and calculations

Following values are collected and calculated:

- ICE = “Initial CO₂ Emissions” in grams per kilometres, converted to “WLTP” value if necessary
- Initial year
- CCE = “Current CO₂ Emissions” in grams per kilometres, converted to “WLTP” value if necessary
- ORP = “Overall Reduction Percentage”
- $ORP [\%] = CCE/ICE$
- d = duration in years
- ARP = “Annual average Reduction Percentage”
- $ARP [\%] = ORP/d$

For analysis purposes the annual average CO₂ emissions reduction percentage of all data and the standard deviation are calculated to make the spread visible. The median is calculated for comparison purposes.

3.2. Analysis

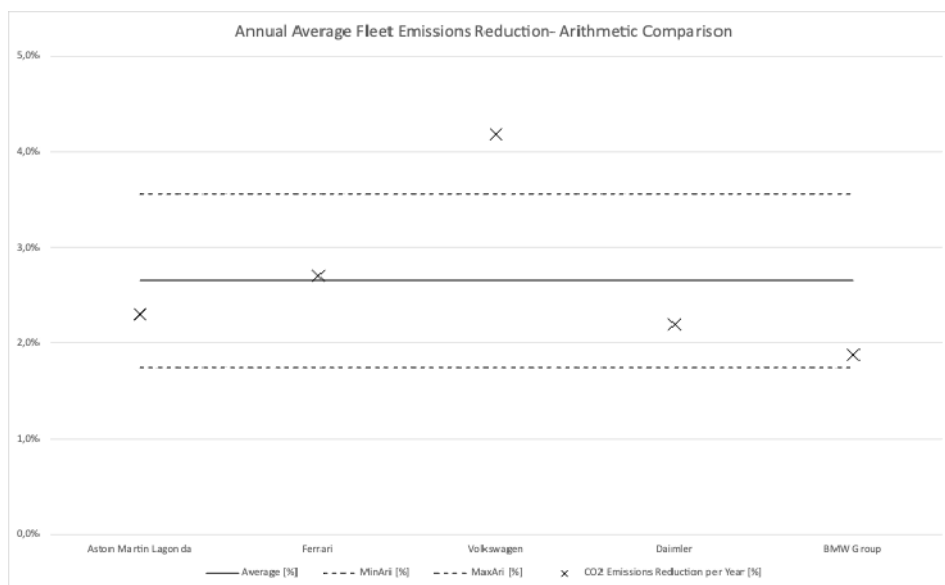
Figure 1 gives an overview of the deployment of the different OEMs. While fore OEMs remain in the same area, Volkswagen stands out clearly. Table 1 gives an overview of the collected and calculated data **from referred sources** (Aston Martin Lagonda, 2021; BMW Group, 2020; Ferrari, 2021; Daimler, 2021; Volkswagen, 2020).

We observe the results of the implemented strategy for each group, heavily discussed because of rare resources and a missing recycling system (Guangdong *et al.*, 2022). In parallel, the European Union had already taken a step back since its decision according to the ban of combustion engines and seems to be open for other sustainable solutions like hydrogen or synthetic fuels (Rasch, 2022).

Table 1. CO2 emission values by year and annual average

Stakeholder	ICE [g/km]	Initial year	CCE [g/km]	ORP until 2021 [%]	d [years]	ARP [%]
Aston Martin Lagonda	470	2000	254	46	20	2.3
BMW Group	252	1995	134	47	25	1.9
Daimler AG	276	1995	125	55	25	2.2
Ferrari	522	2007	338	35	13	2.7
Volkswagen/ excluding Bentley and Lamborghini	144	2016	120	17	4	4.2

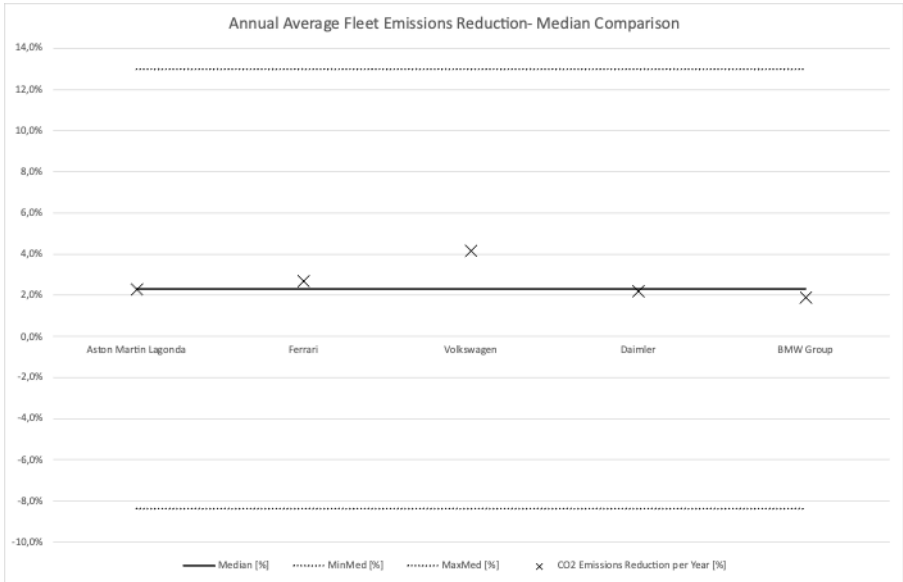
Source: authors' calculations based on data from the annual reports of selected OEMs

Figure 1. Annual average CO2 emissions reductions (arithmetic)

Source: authors' calculations based on data from the annual reports of selected OEMs

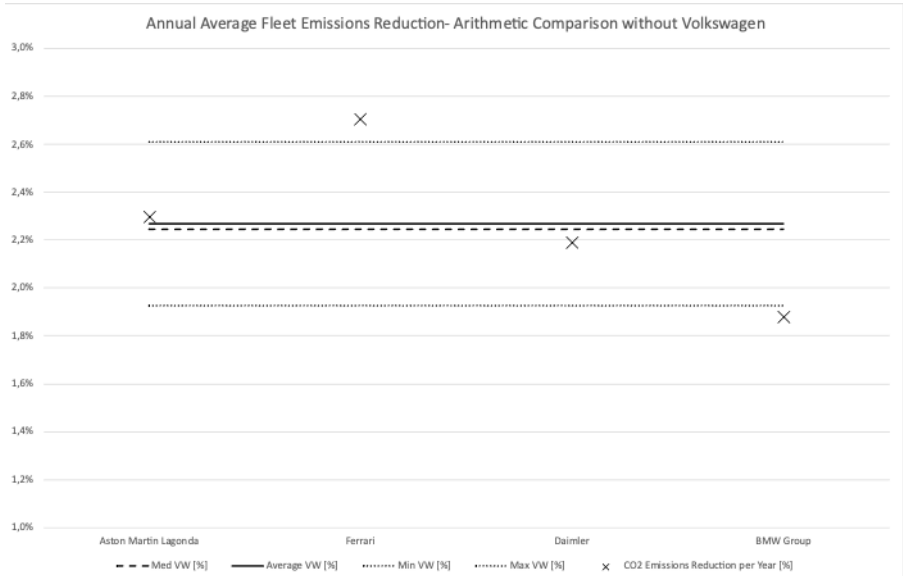
Because Volkswagen shows a very different behaviour, the median is calculated and visible in (Figure 2). Besides the fact that Aston Martin Lagonda, Ferrari, Daimler, and BMW show a very familiar progress, the published values by Volkswagen cause a very high variance in the median calculation. Therefore, the arithmetic calculations are repeated without Volkswagen and visualized in (Figure 3).

Figure 2. Annual average CO2 emissions reductions (median)



Source: authors' calculations based on data from the annual reports of selected OEMs

Figure 3. Annual average CO2 emissions reductions (arithmetic without Volkswagen)

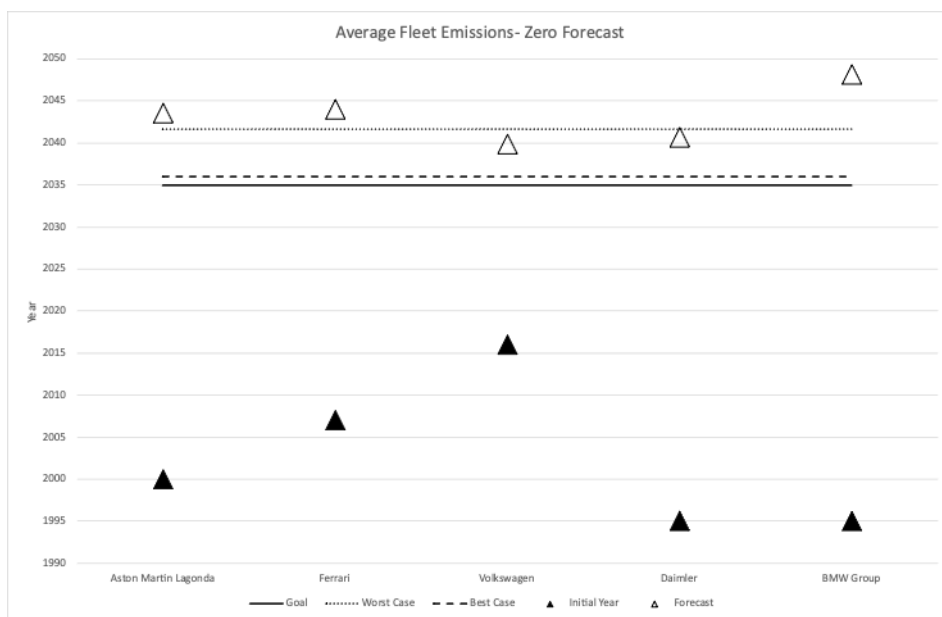


Source: authors' calculations based on data from the annual reports of selected OEMs

The calculated values without Volkswagen seem to show a more representative picture. The arithmetic average and the median are only 0.03 % apart (which represents a deviation of about 10 %, respectively). Therefore, an annual average reduction of CO₂ emissions in the fleet of 2.27 % is assumed in the following. Furthermore, the calculation of the standard deviation results in a maximum of 2.61 % and a minimum of 1.93 %.

For the calculation of the needed duration to reach zero CO₂ emissions, the average reduction percentage is calculated and remains in an overall reduction of CO₂ emissions in the fleet of 58.33 %. This means that there are 41.67 % of CO₂ emissions in the fleet left to be compensated. The offset of the left CO₂ emissions in the fleet against the calculated minimum and maximum of the annual average CO₂ emissions reduction is visualized in (Figure 4).

Figure 4. Zero CO₂ emissions forecast



Source: authors' calculations based on data from the annual reports of selected OEMs

A duration for the reduction of CO₂ emissions in the fleet to zero emissions of 16 to 20 years seems realistic. Since the collected data remains of the year 2020, the goal of zero emissions by 2035 set by the European Union will cause a lot of extra effort in the automotive industry.

3.3. Specification on OEMs

The figures show that Aston Martin Lagonda, Ferrari, Daimler AG, and BMW Group seem to have familiar strategies for the reduction of CO₂ emissions in their fleets. The durations and average annual reductions seem realistic in the comparison. All 4 OEMs might reach zero emissions in their fleets between the years 2036 and 2042. General Motors is not included in the calculations because of the use of the “NEDC”. The offset of the published values against the “WLTP” show a residue of 40 years, respectively. Additionally General Motors is not a European OEM, strictly speaking.

Morgan Motor Company for example is a small European sports cars manufacturer. Therefore, it is questionable how far a reduction of CO₂ emissions can be driven. The business model is not explicit suitable for the topic.

Moreover, because of the analysis, the published values of Volkswagen seem not integer and therefore not sustainable. To verify or expel this hypothesis, another sustainable report of Volkswagen must be considered.

4. CONCLUSIONS

OEMs in general have strategies and implement measures for the reduction of their CO₂ emissions, but not always according to the same standard. The NEDC is not addressed by every OEM in Europe, so not every stakeholder is respected in the current analysis.

Furthermore, a new global standard had been introduced and has been established since 2004, the “WLTP”. This standard is to be included in every sustainable report of OEMs to make values even more transparent and comparable. Nevertheless, the taken measures are partially not effective enough to reach global goals like those of the Paris Agreement or the European Union. But most of the OEMs will theoretically reach zero CO₂ emissions in their fleets during the use phases in the lifecycles within the next 20 years, respectively, if the continuous improvement of emissions reduction stays stressed and new measures for improvement get taken.

Since regulations also contain penalties for exceeding emission limits, it is unacceptable that this development of a realistic measurement method takes more than 50 years and seems to be still ongoing. If decision makers do not provide enough time for the development of deterministic and empirical solutions, and therefore traceable decisions, it will stay impossible to take effective measures. And if taken measures stay ineffective, it will even not be possible to act efficient.

One measure seems to be obvious: 100 % electric, although this strategy is heavily discussed because of rare resources and a missing recycling system. At the same time, the European Union had already taken a step back since its decision according to the ban of combustion engines and seems to be open for other sustainable solutions.

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SEMANTIC ASPECTS IN SENTIMENT ANALYSIS. A STUDENT'S SATISFACTION BEHAVIOUR ON BUSINESS INFORMATION SYSTEMS UNDERGRADUATE PROGRAM

DOINA FOTACHE

*Alexandru Ioan Cuza University of Iași
Iași, Romania
doina.fotache@feaa.uaic.ro*

CODRIN-ȘTEFAN EȘANU

*Alexandru Ioan Cuza University of Iași
Iași, Romania
codrin.stefan@feaa.uaic.ro*

VASILE-DANIEL PĂVĂLOAIA

*Alexandru Ioan Cuza University of Iași
Iași, Romania
danpav@uaic.ro*

Abstract

The image of Business Information Systems (BIS) field of studies influences the students' attractiveness to IT industry. The reputation generated by mass media and social media is more 'geeky' and more professional than it is. In the recent years, many students have chosen to pursue careers in the IT industry and, as a result, the enrolment in BIS programs has increased almost exponentially. However, many students don't declare their satisfaction degree and therefore don't manifest a certain loyalty to the BIS undergraduate program that they are enrolled in or graduated. Consequently, the purpose of this study is to analyse students' sentiments about the BIS undergraduate program and aims to reveal their perceptions about the field as well as to explore their cultural background. The results of this investigation may reveal that the background might influence students' professional IT proficiencies in BIS field. The analysis of results can provide a behavioural pattern of a successful student in the BIS field of study.

Keywords: *sentiment analysis; student's satisfaction; business information systems; undergraduate program.*

JEL Classification: M15

1. INTRODUCTION

In Eastern Europe, several cities are tending to become IT pole – centers, due to high investments made by global IT Businesses. This trend is possible due to the availability of educated people with IT skills as well as a sustainable

local infrastructure. This is the case with the city of Iasi, situated in the NE of Romania, which was designated in 2018 (Mihai, 2018) as the city of the year from the Central and East European region concerning IT industry development and outsourcing. This achievement motivated some researchers (Pavaloaia *et al.* 2018) as well as us, to find the drivers that influence the employees' motivation to perform and evolve in the IT industry, so that other local, national, regional, and even global industries observe and apply. This paper aims to analyze the students' loyalty to BIS undergraduate program and their professors. The paper intends to reveal if there are correlations between student's cultural background and their attachment to BIS in the endeavor to find out if students pursue this program because they possess technical skills or they choose IT domain for other reasons (to obtain a certain degree of financial wealth, to work in a civilized and friendly environment, to identify themselves with BIS brand, to be among best).

2. STATE OF THE ART IN LITERATURE

Universities are paying more and more attention to the Sentiment analysis (SA) of online and offline integrated teaching. The analysis of emotional attitude transmission for both professors and students is important as it may lead to the improvement level of teaching and student's satisfaction. The literature investigation performed analyze two sides of the research: the use of SA in analyzing student's sentiments and the technical aspects involved with pursuing the SA on the dataset.

2.1 The use of SA in analysing student's perception

The recent specialized literature is abundant regarding the SA application in various domains but relatively scarce when referring to its use regarding students' SA. Wang *et al.* (2020), based on student feedback evaluation systems proposed in other studies (Rajput, Haider and Ghani, 2016; Nasim, Rajput and Haider, 2017; Yousif and Shaout, 2018; Dalipi, Zdravkova and Ahlgren, 2021), propose to compute sentiment scores of opinion words and use the aggregated sentiment score as an input to the fuzzy-logic module for analysing and measuring the student feedback and satisfaction. Cunningham-Nelson, Baktashmotlagh and Boles (2019) are focusing on sentiments generated an automated methodology that provides visualizations of students' free text comments from course satisfaction surveys.

Other researchers (Hew *et al.*, 2020) integrate the use of text mining, supervised machine learning, SA, and hierarchical linear modelling to build predictive models of MOOC learner satisfaction and developed a new methodological framework.

2.2 Technical approaches regarding the use of SA

Throughout the literature, SA is being performed at two levels: document-level which classify a document as expressing a positive or negative sentiment and sentence-level that classifies each sentence as expressing a positive or negative sentiment. At a more technical level, SA can be performed using programming languages, such as Python or R who offer specific support libraries for data processing or using tools that include text analysis capabilities such as KNIME and ParallelDots.

Concerning the specific methods used for performing SA, most researchers use Python as a programming language, given its extended support for text processing backed up by specific support libraries for natural language processing (NLP). Researchers use machine learning (ML) approaches where they train a model using a large dataset by applying different machine learning algorithms, such as Support Vector Machine (SVM), Naïve-Bayes (NB), Decision Tree (DT) and Random Forest (RF). The trained model then categorizes the sentiments of the dataset at the desired level.

Most of the analyzed studies turn to ML with supervised learning approaches. Researchers such as (Kousalya and Subhashini, 2019; Persada *et al.*, 2020; Jojoa *et al.*, 2022; Hillaire *et al.*, 2022) all make use of algorithms such as NB, SVM, DT, RF and logistic regression (LR) in their SA studies. These studies follow a similar pattern starting with data collection, pre-processing, feature extraction and reduction and then they train the ML model using a train/test dataset and then apply it to their corpus to classify the sentiments expressed by peers.

A deep learning (DL) approach has also been utilized in several research. BERT – Bidirectional Encoder Representations from Transformers is a ML technique providing a pre-trained model that can be fine-tuned with just one additional output layer to create state-of-the-art models for a range of tasks, including NLP. BERT has been developed in 2018 by Google AI Researchers and offered increased performance over old ways of NLP.

Jalil *et al.* (2022) approach the SA topic with state-of-the-art ML and DL techniques. Their study is divided in four sections: data pre-processing, keyword trend analysis, feature extraction and the classification of sentiments. The researchers used different ML and DL-based classifiers to measure the performance in the sentiment classification tasks and the results indicated that the pre-trained Multi-depth DistilBERT model outperformed the other approaches, confirming the method's state-of-the-art reputation.

Onan applied ML, ensemble learning (EL) and DL techniques on over 66,000 MOOC, massive open online courses, reviews (Onan, 2021). In the ML-based approach, the researcher utilized three term weighting schemes (TP, TF, and TF-IDF). The representation schemes have been evaluated in conjunction with five supervised learners (NB, SVM, logistic regression (LR),

k-nearest neighbor (KNN) and RF) and five ensemble learning methods (AdaBoost, Bagging, Random Subspace, voting and Stacking). The DL-based approach utilizes three word-embedding schemes, one of which utilized by (Jalil *et al.*, 2022) in their study as well (word2vec, fastText, and GloVe) in conjunction with five DL architectures (convolutional neural network, recurrent neural network, bidirectional recurrent neural network with attention mechanism, gated recurrent unit, and long short-term memory). The results of the empirical analysis indicate that EL methods yield a higher predictive performance in educational data mining, compared with the conventional supervised learning methods (Onan, 2021).

The last code-based approach for SA can be described as a lexicon. Lexicons are dictionary of words and their associated sentiments. VADER (Valence Aware Dictionary for Sentiment Reasoning), TextBlob and NRC Word-Emotion Association Lexicon (EmoLex) are some of the most known lexicons used in SA. While VADER is integrated in NLTK – a library that offers NLP capabilities, EmoLex has its own library used specifically for SA, called NRCLex.

Some studies (Neumann and Linzmayer, 2021; Mohd Asri *et al.*, 2020) have used VADER as the lexicon-based approach to SA in their manuscripts. These researchers have employed VADER due to its unsupervised learning nature that fits their datasets and that it does not need a labeled data training dataset, such as in supervised learning methods (Neumann and Linzmayer, 2021; Mohd Asri *et al.*, 2020) have tested VADER lexicon-based method in comparison to supervised learning algorithms such as NB, SVM and DT. Both studies placed the lexicon-based method on top of the supervised learning algorithms in terms of accuracy.

Bhagat *et al.*, (2021) have chosen TextBlob as the lexicon-based method for SA in their research. TextBlob is a library that supports text processing, returning two values as SA output: polarity (values between -1 and 1 indicating scores of negative to positive) and subjectivity (values between 0 and 1 indicating the degree of personal implication in the respective text).

Vietnamese researchers (Tran *et al.*, 2021) make use of a specific lexicon for their research. To calculate emotion scores for words and phrases, they used the Vietnamese sentiment dictionary – VNSD – built based on SentiWordnet and slightly modified to deal with the cases of social networking and teen language by adding emotional words in the form of social media, which contain 126 variations all together and a dictionary of emoticons with 36 icons.

Tools with text analysis capabilities, such as KNIME and ParallelDots, have been used in a reduced number of studies. Asim *et al.*, (2021) have used ParallelDots – a Microsoft Excel Add-in that provides text analysis functions in 15 languages – to perform SA on 519 survey responses among the students of Pakistan Universities. Others (Yefta, 2022) have used the text mining function of

KNIME to perform Lexicon-Based SA using dictionaries from previous research (Liu, 2012) as a comparison to the Flair NLP framework's results from the same study – which were obtained from a ML model trained on IMDB dataset. Despite the comparative approach, no accuracy scores were provided by the author for any of the two methods used in SA.

3. RESEARCH METHODOLOGY

The current research was conducted throughout a case study on BIS undergraduate program from Alexandru Ioan Cuza University of Iasi, and more that 590 responses from IT profile students' responses were obtained during 2016-2021. The predictors of satisfaction that were collected in this study, as independent variables, include students' culture, the level of creativity, the good reputation of the BIS undergraduate program and the semantic analysis of the words in the messages addressed to their teachers.

The answers received from BIS students required a certain standardization as they contain different lexical and wording styles (the use or not of diacritics, punctuation marks, specific vocabulary to different geographical region, etc.). Therefore, we resort to pre-processing procedures of text data. For these actions, Python language is used, due to its efficiency and universality proven over time in all areas of programming (Machine Learning, Artificial Intelligence, Neural networks, Data analysis, Object Oriented).

The decisions to use Python over R for the data processing capabilities is since Python is supported by specific libraries that facilitate the SA. Moreover, for pursuing the SA we used a lexical dictionary (lexicon) provided by NRC Canada. The EmoLex lexicon helps us interpreting each student sentiment by analysing the meaning of the words in the answer provided for each question. Although the R language also offers data processing methods, the packages, and tools available for Python facilitate the processing of text data. Also, Python is the choice of most professionals working in the field of NLP, respectively, for the SA. The decision to working with Python language presents a high degree of comfort for the research team due to their work experience.

3.1. Research hypothesis

The main research hypothesis (MH) is Students who have cultural interests and express themselves in positive feelings regarding the undergraduate program are the prototype of the BIS student. To validate the MH, we have also formulated 4 secondary hypotheses (SH), such as:

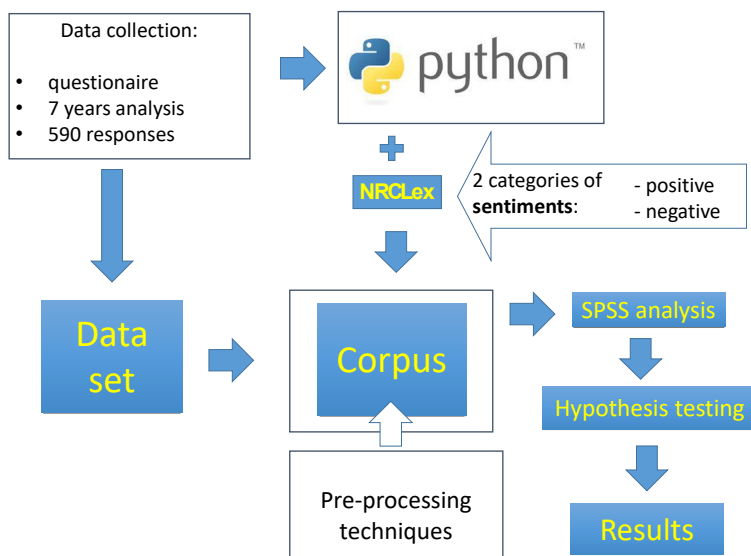
- There is a correlation between the level of professional training and the students' sentiments toward BIS undergraduate program - SH1;
- There is a correlation between the self-perceived cultural level and the students' sentiments toward BIS undergraduate program - SH2;

- There is a correlation between the future education endeavours and the students' sentiments toward BIS undergraduate program - SH3;
- There is a correlation between the cultural background and the students' sentiments toward BIS undergraduate program - SH4.

3.2. Data collection and research design

The data set used in the SA consists of the students' responses to a questionnaire used to measure their satisfaction with the BIS study program. The questionnaire contains 39 questions grouped in 4 categories and it was distributed to BIS undergraduate students between 2015-2021. More than 590 valid responses were collected and processed with Phyton programming language for semantic analysis and SPSS for statistical analysis and hypotheses validation. The research methodology is presented in Figure 1. The responses for 6 questions (checking the students' background and cultural level) formed the data set presented in Table 1. The obtained corpus was pre-processed for standardization purposes and analysed in Phyton for sentiments detection. Case transformation as well as punctuation, numbers, and spaces removal were applied on the students' responses.

Figure 1. Research methodology



Source: authors' own projection

The answers provided to the questions displayed in Table 1 were analysed in Phyton using specific libraries and the NRCLex Lexicon. This lexicon was

selected due to its wide utilization within other research and due to the fact that it contains a database of words in more than 40 languages.

Table 1. The questions included in the SA

Do you consider that BIS is a brand? Motivate. (Q1)
Please send a message to the next generations. (Q2)
Please send a message to your professors. (Q3)
What are the first 3 words that come to mind when you think of colleagues from BIS? (Q4)
What did the undergraduate studies mean to you (3 words)? (Q5)
What are the first 3 words that come to mind when you think of BIS undergraduate program? (Q6)

Source: authors' own projection

An example of the coding in Python is illustrated in Figure 2. Two actions were performed within the code, besides translation, for each question included in the analysis. Firstly, it was created a dictionary with the emotions and their scores for each line (answer) of the question. The line will be updated after analysing each word of the sentence. Secondly the code allows to calculate the emotions for each line (answer) of the question currently being analysed.

Figure 2. Example of applying SA in Python for one of the questions in the study

```

1  from ast import While
2  from cgi import test
3  import pandas as pd
4  import re
5  from nrcllex import NRCLex
6
7  translate_data = pd.read_excel(open('NRC-Emotion-Lexicon-v0.92-In105Languages-Nov2017Translations.xlsx', 'rb'),
8                                sheet_name='NRC-Lex-v0.92-word-translations')
9  analysis_data = pd.read_excel(open('intrebari.xlsx', 'rb'),
10                               sheet_name='Sheet1')
11  analysis_list=list(analysis_data['Vă rugăm transmiteți un mesaj profesorilor dvs.'])
12  dataForExcel=[]
13
14  #---create a dictionary with emotions and scores for each sentence that will be updated after analyzing each word of the sentence
15
16  def update_emotions(emotions_dict, current_emotion_dict):
17      for item in current_emotion_dict.keys():
18          if item in emotions_dict.keys():
19              emotions_dict[item] += current_emotion_dict[item]
20          else:
21              emotions_dict[item] = current_emotion_dict[item]
22      return emotions_dict
23
24  #---calculate emotions of the sentence starting from the first word and sends the rest of them to emotions dictionary for upload
25
26  def calculate_emotion_of_sentence(sentence):
27      emotions = NRCLex(sentence[0]).top_emotions
28      emotions_dict = dict((x,y) for x, y in emotions)
29      for word in range(1,len(sentence)):
30          emotion_word = NRCLex(sentence[word]).top_emotions
31          current_emotion_dict = dict((x,y) for x, y in emotion_word)
32          emotions_dict = update_emotions(emotions_dict, current_emotion_dict)
33      return emotions_dict
34

```

Source: authors' own projection

An exempt of the resulting file can be depicted from Figure 3. For lack of space reasons, we include only the results of SA on two questions. As in this

stage of the research we are interested in the positive and negative sentiments, we have eliminated the emotions extracted by the analysis. Some lines (answers) were invalidated due to the translation issues. Because all the questions included in the study were open type, the respondents expressed themselves in a very irregular form. In the future studies we will elaborate on this limit of the study to maximize the number of lines included in the study.

Figure 3. The results of applying SA on the student's answers

Q1	Q2
{'positive': 1.7, 'trust': 0.2, 'surprise': 0.2, 'joy': 0.7, 'anticipation': 0.2}	{'positive': 1.0, 'fear': 0.0, 'anger': 0.0, 'anticip': 0.0, 'trust': 0.0, 'surprise': 0.0}
{'positive': 1.0}	{'trust': 2.0, 'anticipation': 1.0, 'positive': 1.0, 'fear': 0.0, 'anger': 0.0, 'anticip': 0.0}
{'positive': 0.3333333333333333, 'joy': 0.3333333333333333, 'anticipation': 0.3333333333333333}	{'anticipation': 1.0}
Traducere ineficienta	{'positive': 1.0, 'fear': 0.0, 'anger': 0.0, 'anticip': 0.0, 'trust': 0.0, 'surprise': 0.0}
{'negative': 0.5, 'sadness': 0.5, 'positive': 1.0}	{'trust': 0.5, 'positive': 0.5, 'negative': 0.5, 'sadness': 0.5}
{'positive': 1.0, 'fear': 0.0, 'anger': 0.0, 'anticip': 0.0, 'trust': 0.0, 'surprise': 0.0, 'negative': 0.0, 'sadness': 0.0, 'disgust': 0.0}	{'positive': 1.0}
{'positive': 1.0}	{'fear': 0.3333333333333333, 'anger': 0.0, 'anticip': 0.0, 'trust': 0.0, 'surprise': 0.0}
{'trust': 0.2, 'surprise': 0.2, 'positive': 1.2, 'joy': 0.2, 'anticipation': 0.7, 'negative': 0.5}	{'positive': 1.0, 'fear': 0.0, 'anger': 0.0, 'anticip': 0.0, 'trust': 1.0, 'surprise': 0.0}
{'fear': 0.0, 'anger': 0.0, 'anticip': 0.0, 'trust': 0.0, 'surprise': 0.0, 'positive': 1.0, 'negative': 0.0, 'sadness': 0.0, 'disgust': 0.0}	{'positive': 1.0}
{'trust': 0.5, 'positive': 0.5}	{'fear': 0.0, 'anger': 0.0, 'anticip': 0.0, 'trust': 0.0, 'surprise': 0.0, 'positive': 0.0}
{'positive': 2.0}	Traducere ineficienta
{'negative': 0.5, 'sadness': 0.5, 'trust': 0.5, 'anticipation': 0.5}	{'positive': 1.0, 'fear': 0.0, 'anger': 0.0, 'anticip': 0.0, 'trust': 0.0, 'surprise': 0.0}
{'anger': 0.16666666666666666, 'trust': 0.16666666666666666, 'surprise': 0.16666666666666666, 'positive': 0.16666666666666666}	{'trust': 0.5, 'positive': 1.5}
{'positive': 2.25, 'surprise': 0.25, 'joy': 0.25, 'anticipation': 0.25}	{'positive': 0.3333333333333333, 'joy': 0.3333333333333333, 'anticipation': 0.3333333333333333}

Source: authors' own projection

The last step of the research was to carry out the statistical analyses for the purpose of hypotheses testing. In this endeavour SPSS version 26 was used and matched the answers of the 6 questions with other 4 (presented in Table 2) with were 5 Likert scale type.

Table 2. Questions used in the Hypothesis testing

How do you rate your level of professional training? (Q7)
How do you rate your cultural level? (Q8)
What maximum level of education did you aim to achieve? (Q9)
How important are the following to you (Theatre, Opera, Concerts with classical music, Frequenting the library for reading, Other) (Q10)

Source: authors' own projection

In the statistical analysis we have corelated each of the questions in Table 2 with the 6 questions from Table 1. In this way we have identified the correlation between Students':

- level of professional training (self-evaluation) SH1
- cultural level interest (self-evaluation) SH2
- future education endeavours (self-evaluation) SH3
- cultural background (self-evaluation on 5 sub-questions: Theatre, Opera, Concerts of classical music, Frequenting the library for reading, Other) SH4, and their perception depicted from the answers given to the 6 questions (Table 1) on which the SA was applied.

4. RESULTS

The results confirm the secondary hypothesis by showing there is a correlation between the questions Q1-Q6 (check Table 1) and the level of professional skills they possess (Q7), their future education plans (Q9) and cultural interest(Q8) and background (Q10).

The students who appreciate BIS curricula, recommend the undergraduate program and express positive feelings in written messages (Maintenance/satisfaction focused on recommending the university and whether to stay or transfer from it and was measured by these two statements: (a) “I would recommend this university to a friend or family member,” and (b) “I am considering transferring to another college or university before graduation because I am dissatisfied at this university.”)

The level of education proposed could be correlated with the difficulty level of the courses, creativity, and the good reputation of the BIS undergraduate program. Furthermore, the study reveals that by cultivating the pride of pursuing BIS studies can be correlated with the analysis of the words in the messages addressed to their professor and future generations of students pursuing the BIS undergraduate program.

5. CONCLUSIONS AND FUTURE PATHS OF RESEARCH

In our research endeavours we have observed a scarcity of articles that treat satisfaction from the opposite angle in comparison with the one treated in the current article, namely from the point of view of professors. Such perspective research deserves all the attention, and we intend to study it in future research, and in this respect, we mention a depicted trend that the satisfaction related to a study program depends on the sentiments transmitted by the happiness or unhappiness of the teachers. In this regard, the well-being of teachers is considered not only dependent on the contextual conditions of the individual workplace, but also influenced by teachers’ job crafting (Dreer, 2022).

The research results of the paper confirm the hypothesis according to which, the students that possess cultural interests and express positive sentiments regarding the undergraduate program variables (curricula, professors, program environment) are the prototype of the BIS student. The results can be extended to similar undergraduate study programs from other Romanian Universities. Among the limits of our research, we mention the followings:

- we only analysed the positive and negative sentiments;
- there were some translation issues, as it can be seen in Figure 3, and it led to the loss of some answers;
- not all questions were mandatory and because of this, many answers were lost;
- during Pandemic, there was a low response rate and that is why we did not include a year analysis within the research.

In our future research paths, we intend to continue the research in the following years. In this regard, we will include in the analysis the emotions not just sentiments. Furthermore, we would like to emphasis on the loyalty analysis to BIS before, during and after Pandemic studying the online learning impact on students' satisfaction.

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A FOLLOWER'S PERSPECTIVE OVER THE IT LEADERSHIP IN ROMANIA

IOANA GUTU

*Alexandru Ioan Cuza University of Iași
Iași, Romania
gutu.ioana@yahoo.com*

DANIELA TATIANA AGHEORGHIESEI

*Alexandru Ioan Cuza University of Iași
Iași, Romania
dte@uaic.ro*

Abstract

Leadership is a key driver for the management performance of most industries. Largely known for its behaviours and influence over followers, it depends of two main factors: organizational culture towards leaders performance, and followers ability to adapt and subscribe to desired organizational behaviours. The dilemma can be at first analysed as from a leader's perspective, in regard with their knowledge and level of understanding of the depths and significance of their actions and, secondly, as for the followers' attributes and willingness to integrate and adapt to new organizational leadership motivational and stimuli techniques. When regarding leadership, on both organizational and/or individual levels, literature generally refers to it only by undertaking a leaders' perspective, since followers' behaviours and attitudes are considered in terms of leadership outcomes. The current research could not identify any leadership construct or theory that also regards the followers' role and perspective, along with the leadership view. Despite the increasing organizational accent over leadership importance in regard with organizational performance and development, for the IT companies after a decade of steep evolution, being on the peak for technical innovative solutions, leadership importance has also accentuated. The current research focused on the IT leadership in Romania, by performing an analysis of the transformational leadership attitudes and performance, as from a followers' perspective; moreover, a descriptive analysis of the IT Industry and depths of followers understanding of the transformative leadership practices will be conducted. The research instrument, a 24 items questionnaire was applied, and data received counts 215 views. Results will underline a new perspective of the IT Industry in Romania, by offering a characterization of the organizational architecture from a follower's view. Moreover, the current research brings an added value in regard with the follower perspective for the transformational leadership practices within the organizational IT environment.

Keywords: leadership; IT industry; management.

JEL Classification: M1

1. FOREWORD

Leadership and followership are two subjects in literature that were systematically misled and interpreted by literature. Despite the increased interest displayed by researchers and theoreticians for leadership, as theories, debates, typologies and practices, followership was largely misunderstood and often treated as a part of leadership, to whom all the literature behind will be applied. Only recently it was retrieved that leadership depends on different followership perspectives, features, and typology. It would be natural that one leadership practice applied within a given industry should be adapted for another industry, not only from the leadership perspective, but mainly from the followership perspective, as level of understanding, perceptions, age, gender, education, years of experience within the field.

For the current research, after revisiting a large part of the most important leadership theories and assess and understand if a follower's perspective was enabled, authors considered the IT&C industry in Romania, to design a follower portrait, a step recommended for any company which invests in leadership practices as part of its organizational culture. The IT&C industry was studied from a 360° perspective, where all the members of the companies were respondents for a questionnaire designed to study leadership from a follower's perspective.

Results will show differentiations in respect with gender, years of experience within the field and education, since IT&C Industry holds a special status among all the industries that activate in Romania.

2. FOLLOWERSHIP INSIGHTS WITHIN THE FOLLOWERSHIP - LEADERSHIP LITERATURE

Various disciplines addressed the question across literature as whether leadership or followership cultures should be pursued and encouraged across organizational management. Literature suggests no less than eleven leadership theories, but as they will be presented below (Rost, 1993), neither of them explains followership or the essence of a follower existence from an organizational perspective. Each leadership theory provides explanations as to the leadership forms and manifestations (Owsu-Bempah, 2014), but many fail in touching the subject of why followers and followership should (not) exist (White, 2011).

The oldest leadership theory as it is considered within the literature, The Great Man Theory goes back in history and relieved through the work of Aristotle; the current theory suggests that leaders are born and not made, since they are special human beings capable of doing things that are out of the ordinary and change environments, due to their natural virtues as intelligence, morality and determination. Such Great Men derive from the figures of historic leaders whose exceptional figures and actions passed the test of time. According

to Van Vugt and Grabo (2015), this theory can still be identified across the business field, although it fails to explain how these organizational leaders support undistinctive and unremarkable lives outside the corporate doors, without possessing out of the ordinary qualities and/or without displaying them for long periods of time.

As easily noted, the current leadership theory fails to explain the followership perspective (Javidan *et. al.*, 2010), since the focus is only on the leaders' qualities and behaviors, while their effects in terms of followers are inexistent. For the business world it is most likely that such behaviors can only be recognized within highly bureaucratic companies, where investments in followership attitudes and behaviors are not justifiable.

As for the second leadership theory noted by the literature, the Trait Theory derives from the Great Man Theory and assumes that a leader has traits and attributes that can be either born or acquired through time and experience. Staring from essential attributes as ambition, intelligence, and extroversion (Arnold, 2021), literature added a rather long list of learned features as dominance, assertiveness, persistence (Stogdill, 1974) or creativity and social skills (Bass, 2008). The trait Theory does not assume that leaders should possess all these qualities at once, but rather should manifest a situational framework that require different sets of abilities and skills (Stogdill, 1950).

It is important to note that within the current theory Bass (2008) added for the first time a followership perspective for the leadership abilities, namely the required social skills. This is the first reference within literature on the importance of the followership aspect for one leader, meaning an acknowledgement of the fact that within organizations (Avolio, 2007), leaders do not act alone (Nawaz and Khan, 2016), and it is important for them personally and for their work, professionally, to communicate well and understand and be understood through behaviors, attitudes, communication by the ones that make members of their teams (Drucker, 1996).

The leadership psychoanalytic theory starts from the Sigmund Freud's idea where small groups or societies are like primitive tribes, meaning miniature families, where the leader assumes the role of the father of the tribe. According to this theory, followership is for the first time rightfully considered as directly linked to leadership traits and behaviors (Dugan and Komives, 2011). Leadership has the form of a derivative of the father – son/daughter childhood relationship, where children mostly adopt the mirroring behavior, while others achieve greatness by trying to compensate for fathers that do not exist or that are absent. Any of these two cases capture the essence of followership, since children will always be followers seen from the shadows of their leader, in this case, their father. As Anderson *et. al.* (2017) suggests, the psychoanalytic leadership theory explains both leadership and followership behaviors, based on the emotions and the love or fear father-child relationship (Mango, 2018). This

theory is simplistic and highly speculative, since no other factors (situational, dispositional) are considered, the behavior and personality of an individual deriving directly and singularly from the father-child relationship.

The charismatic leadership theory emphasize charisma, as the most important attribute of individuals as political and religious figures, which according to this theory, cannot be defined but rather felt when encountered (Winkler, 2010). In its view, followers are being attracted by leaders rather through their personality and personality, therefore charisma, oratory skills and manipulation are emphasized and considered with an increased importance, contrary to the traditional theories wisdom or expertise. According to Ludwig (2002) the charismatic leader is considered by its followers as being a social glue, whilst abilities of manipulating and bringing together large numbers of people (followers) is a high order capability (Lynch, 2012). The current theory does not explain charisma nor its origins, born or learned, but emphasize the fact that across history, charismatic leaders tend to be rather observed as manifesting their influence in hard and not in peaceful times.

According to the current theory, followers' perspective is being reiterated, since charismatic leadership is demonstrated by individuals which have the abilities to woo strangers, masses of people (as followers), therefore the strength of the current theory resides not in the abilities of the leaders, but within the mass's attitudes, behaviors, decisions and determination to adhere to a leader's ideology.

The leadership behavioral theory emphasizes to a certain degree the opposite side of the charismatic leadership theory, since it addresses, as Van Vugt and Grabo (2015) agree, the concern for tasks and employees, as a result of leader's actions. The current theory's concern for employees indicates the existence of two types for leading (as Theory X/Theory Y presented by McGregor in 1968). According to Theory X, leaders start from the assumption that the average follower/employee within an organization, dislikes work and does not have any interest in engaging in new activities, and assuming responsibility, because of the lack of ambition. Theory Y assumes that leaders must motivate their employees, since they can achieve out of the ordinary results if properly motivated. Therefore, the behavioral leadership theory presents leaders styles as authoritarian and/or participative.

The behavioral leadership theory addresses followers' perceptions in regard to their leader according to the leadership style that is performed, that can be improved and/or adapted in accordance to followers needs and requirements. Despite this perspective, the current theory fails to explain situational needs for different leadership styles (as autocratic and/or participative).

The situational leadership theory accentuates the characteristics of each situation as emphasizing the leadership effectiveness; Tannenbaum (1961) recognize this type of leadership behavior as strong and/or permissive, based on

the course of action imposed by the situation and its necessities, rather than the abilities of the leader. As Brehm (1997) suggest, autocratic leadership is mostly required within uncertain and changing environment for an organization, while a participative style is mostly needed in peaceful (Danesy, 1987) and unchallenging organizational situations.

A follower's perspective therefore is not directly considered by the situational leadership theory, although a situational perspective implies a followers' psychological reactance, hence followers' behaviors, attitudes and thinking manner in (un)certain situations.

The contingency theory, as derived from the situational leadership theory, not only considers the leadership/organizational situation but also a series of factors as organizational goal requirements, the leader's power, and the type of organization (Fiedler, 1967), determining the leadership main characteristic as task and/or relationship oriented. Combining a situational organizational perspective and the importance of variables within a certain task, literature identifies many leadership categories.

Followership, as identified in the situational leadership theory, is unsatisfactory explained, since no reference is being made to parameters in regard with followers' abilities, willingness to achieve goals or specific behaviors. Therefore, both situational and contingency leadership theories have the same problem, as being unable to define followership along with the leadership origins.

The transactional leadership theory primary focuses on autocratic leaders that determine followers to achieve goal. Moreover (Burns, 1978) a transactional leader considers the existence of a clear, strict, and transparent organizational structure as with utmost importance. Bureaucratic organizations do not value creativity or rules adaptation in accordance with people (leaders or followers) needs, but pursues success by strictly following rules and issuing rewards and punishments in cases of success and/or failure.

On the opposite side, the transformational leadership theory (Barbuto, 1997) focuses on the expressivity of their leaders in relation to followers. As Burns (1978) states, transformational leaders are being noted as showing a special interest for followers needs, by inspiring them and freely and openly expressing their thoughts and organizational course of actions towards their followers. If transactional leadership style emphasized up to bottom actions, on the opposite side, the transformational leadership style negotiates the leader-follower relations and positions within the organization. Followers are considered by both leadership styles, transactional and transformational; while fear and instrumental needs (as salaries or another organizational benefits) as modal or means-values govern the follower-leader transactional perspective, on the transformational side, admiration and expressive needs are being outlined as end-values as organizational liberty or equality.

As none of the transactional and transformational leadership styles cannot apply as a prototype that can be validated in any possible circumstance, followership remains within uncertainty, since it is being presented as a direct consequence of the adopted leadership style, without having any autonomy.

The dispersed/emergent leadership theory considers situations where the organizational hierarchy is flexible, and followers could have the freedom not only to attend, but also participate in establishing organizational ranking systems. As Barry (1991) suggests, there are numerous types of followers within a wide range of organizations focused on overcoming technology and environmental concerns, therefore a distributed leadership is necessary. Organizational power is dispersed among a range of interconnected followers and employees; therefore, leadership is rather naturally shared and not hierarchical assigned. As Barry (1991) and Van Vugt and Grabo, (2015) suggest, complex arising problems and productivity and creativity concerns are better addressed by leaders and followers within an emergently distributed leadership theory. The distributed leadership theory is appraised as the leadership of the future, but there is no comprehensive explanation of leadership and followership convincing roles and different attributes perspective.

The servant leadership theory considers that a better society can only be asserted through affirmative builders that fight the injustice and bad things that arise, and consider (Volckmann, 2012) that the interests of the group are highly important compared to the ones of an individual. For the servant leadership theory, the leader is seen as an individual willing to pay a price for the benefit of the group or the society, aiming for long-term goals and inspiring their followers and taking risks for success or failure of their actions (McCleskey, 2014). Corporate organizations today are highly characterized with profit-oriented leaders who mostly value short term gains and corporate success, rather than the ones of the society or a group.

The servant leadership theory values followers and their personal circumstances more than the ones of leaders but does not address the question whether this leadership style as attractive and even desirable as it is being presented, would benefit followers through self-sacrifice, nor depicts the reasons of such behaviors.

As for the abovementioned theories, depictions show that the current leadership literature does not reflect its attention on the followership features, since theories and classifications only require leaders and leadership practice, without considering the importance of the environments (as followers and industry traits and specificities) the apply the leadership within.

3. THE IT FOLLOWER PORTRAIT - A CASE STUDY OF ROMANIA

In order to assess a complete follower's perspective over the IT leadership in Romania, a description of the followers' profile and competencies would be

necessary. The current case study considers the members of two IT&C companies in Iasi, Romania, with an effective of 53 members, as leaders and followers. As for considering the followership perspective, the final database will only consider 50 members, resulting from excluding the top management of the companies.

It is important to notice that the IT&C industry in Romania is relatively young, while the most representative companies' population is rather represented by small and medium companies, and not corporations or transnational companies. This is the reason for which the authors considered as important to study the followership of small and medium IT&C firms.

According to the collected data, the IT&C industry is still dominated by the male world (68%), out of which 58% are aged between 20-30 years old, and only 4% of the male followers keep going within the company in the age interval 31-40.

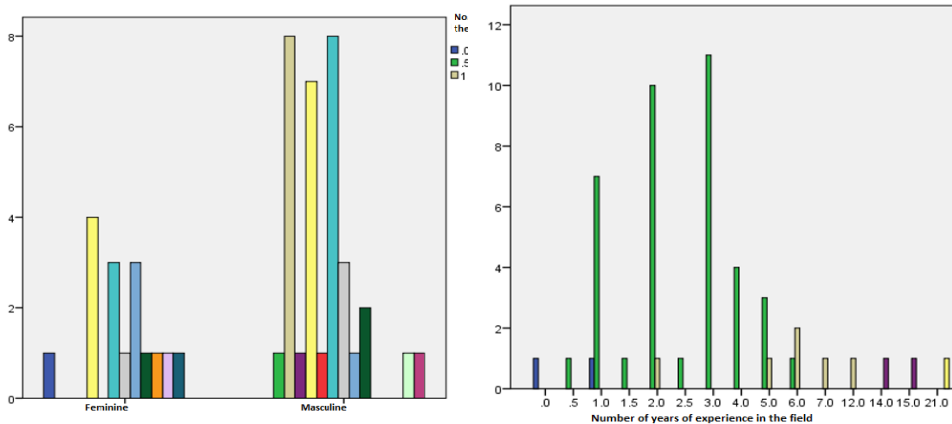
The 32% of the female representatives seem to develop slower, since 8% (aged 31-40) compared to 4% of the male representatives will continue their work, within the same age segment. In respect with age, data shows that 2% of the male representatives (0% of the female representatives) will continue to activate within small and medium companies.

When about considering the age of the followers from the IT&C companies, the segment 20-30 years old prevails again, with 78% of the active members, while only 2% age >51 years old still activate within these companies without upholding top management positions. It is important to note that for the currently described industry, a working trend is developing among young people aged 14-19 years old, and companies seem to be open to these developments, since they create favourable conditions for 4% of their followers to activate within. Data is being confirmed when taking into consideration the studies level of the respondents, out of which 6% of the active members of the considered companies did not graduate high school yet. Following the same perspective, 20% of the followers are working while studying as enrolled to Bachelor studies, while the great majority (of 68%) graduated the University.

For reasons of standardization, researchers also took into consideration the number of years of experience within the area the respondents activate within; data shows that 22% of them have 2 and 3 years of experience respectively, while 8% have only 1 year of experience. The current results suggest and enhance once more the theory according to which IT&C companies in Romania, despite the small number of years of existence, also display a trendline for being a talent nursery for IT&C youngsters. The current behaviour displays an increased competition among companies for reaching for increased numbers of workforce representatives, a scenario where the need for leadership and its specific practices, adapted for the industry needs and specificities, arises.

When considering the gender and the number of years of experience in the area the respondents activate within, it is important to note that for the interval 0-3 years of experience, the male world prevails, and have the highest percent for all the categories; surprisingly, for the 5, 7, 12, 14 years of experience milestones, the proportions are reversed.

Figure 1. Follower's gender and years of experience within the field



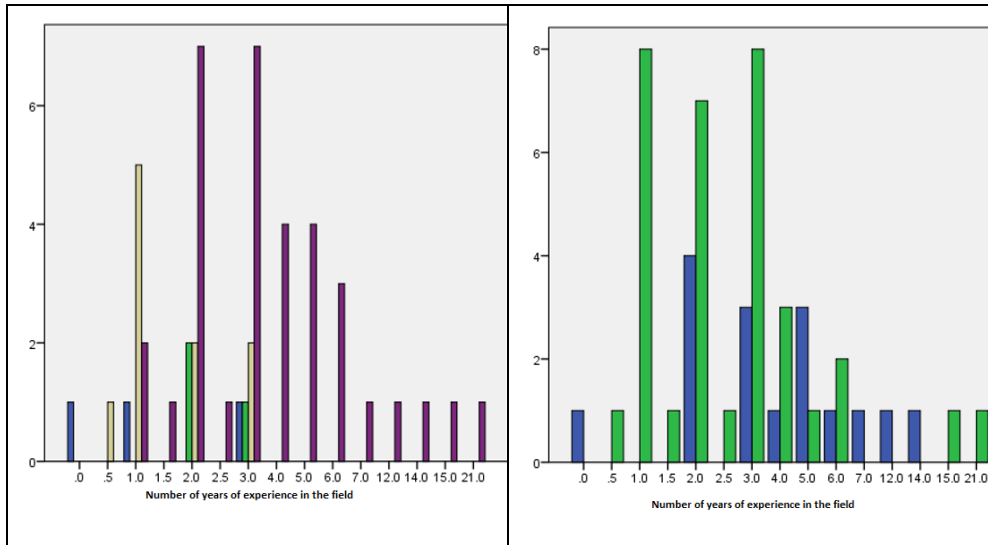
Source: authors' calculation

Another peculiarity reveals the fact that for the no high school and during high school periods of time, the feminine representatives choose to work within the IT&C companies (6.3% for both intervals) and completely stop while being students, a point in time where the masculine gender talks the working scene (see Figure 1). The scene diversifies again after graduating the University, a moment in time where female graduates enter the working field but are dominated by the increased years of experience of the male workers who never abandoned the working scene.

The central role of age in relation to the years of experience in the field explain the fact that the age segment 14-19 has 0-1 years of experience, while the segment 20-30 years old, has 3 to 1 years of experience in the field (see Figure 1).

By following a similar perspective, most of the students have at least one year of experience in the field, while the graduates display increased numbers in the interval 2-3 years of experience.

Moreover, the gender differentiation shows the prevalence of the masculine effectives for the 1-3 years of experience segment, while starting from 7-21 years of experience in the field, the gender difference seems not to be valid (see Figure 2).

Figure 2. Followers' education, gender and years of experience within the field

Source: authors' calculation

For reasons of standardization, the IT&C follower portrait did not evolve and balance the equation from the gender perspective, since the average follower is still a male. As for the age, results show slight behavioral differentiations, since the IT&C follower follows an industry-specific trendline of starting its career early compared to other industries, in the age interval 14-19, and reaches the maturity within the 20-30 age interval (see Figure 2). An average IT&C follower has 1-4 years of experience within the field, before occupying leading and top management positions, and is an University graduate.

An IT&C followers' career, after reaching 3-5 years of experience, does not make any differentiation from the education, gender and age point of view; these phenomena seem to be a specificity of the IT&C industry, where human resources retention seems to be lacunary for seniors, while the battle for human resources effectives is given for the field of junior followership.

4. FINAL REMARKS

Followership is a subject that is lacunary treated by most of the authors who consider leadership as with primary importance for the existence and development of an organization. Recent studies show that for leadership practices to be implemented and offer expected results, leadership assessments are necessary, varying from industry typology and specificity, and continuing with personal followership features that need to individually be assessed.

The central role of the follower within the IT&C industry in Romania is studied in the context of an increasing expansion of the industry, where small

and medium companies prevail in importance, as opposed to multinational and transnational companies that activate within the same field. The average IT&C follower need to have special behavioural and educational features, that need to be assessed and cultivated by companies as early as possible, due to increasing competition. For this reason, results show a trend mark for this industry to create talent nurseries and acquire workforce even as non-high school graduates, to be trained according to the industry and company specifics. Therefore, the average IT&C follower is younger in respect to other industries, generally a male, aged between 20-30, and still a student. For this reason, the IT leadership needs to be individually adapted to this follower portrait, since the work environment and tasks generally require special individual attention for followers which are not seniors, namely most workforce personnel within the given industry.

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SOME ROMANIAN ACCOUNTING AND TAX EVOLUTIONS IN THE DEFINITION OF THE GROUPS OF ENTITIES

COSTEL ISTRATE

*Alexandru Ioan Cuza University of Iași
Iași, Romania
istrate@uaic.ro*

Abstract

Accounting consolidation by reporting relevant financial information about the group, has been a model for tax authorities. From a fiscal point of view, we could identify at least three distinct situations about the groups and the transactions between the components of a group of companies: fiscal definition of the affiliated persons, fiscal treatment for the VAT groups and fiscal treatment for income tax groups. In the case of the transactions between affiliates, the fiscal rules allow the tax authorities to restate some information, in order to calculate taxes on a fair base. Starting with 2007, the Romanian fiscal code introduces the notion of VAT unique fiscal group, i.e. designate legally independent persons, but with close financial, economic and organizational links (with a threshold of 50% in the voting rights). This group can be considered as a single taxable person, the major advantage representing it the opportunity to offset the payable VAT and the VAT to be arising recovered from different components of the VAT fiscal group. Finally, the Romanian tax authorities introduced, in 2018, in the fiscal code the chapter that allows the recognition in Romania of the tax group in the field of corporate income tax. The threshold of the voting rights in this case is 75% and the group have the opportunity to calculate and to pay a single tax for the entire group, eventually offsetting the profits of some components against the tax loss of another component.

Keywords: *group of companies; accounting consolidation; affiliates; VAT fiscal group; income tax group.*

JEL Classification: H20, M40

1. INTRODUCTION

The different objectives of accounting and taxation justify the differences between the way in which companies and groups of companies produce and report accounting information, on the one hand, and how they calculate, pay and report tax information, on the other. Establishing the majority of taxes based on accounting data, as well as the trend of companies to pay low taxes lead to attempts to reduce the tax base, including by applying accounting procedures. In this regard, the rules of financial reporting at the level of company groups can also inspire the fiscal authorities in proposing criteria for establishing taxes that take into account not only the transfer prices - considered suspicious - but also by the fiscal adaptation of some techniques, as accounting consolidation. It is

possible that, insofar as the taxes are calculated at the group level, the companies will take advantage of the possible compensations and eliminations between the amounts reported by the individual components of the group and to give up or to limit the application of other fiscal optimization techniques, which may be located at the limit of legality and could create litigation with the fiscal authorities.

Accounting consolidation - that is, the procedures for drawing up a set of financial statements at the group of enterprises - represents the path to obtaining and providing credible and relevant financial information about a group of companies, each of them being legal person, but under the control of one of them. The accounting rules take into account only the financial groups, i.e. those in which a company - called parent company - holds sufficient participations in other companies - called subsidiaries. In many situations, to the parent company and subsidiaries are added to the associated companies, as well as those controlled in common, for the consolidation of which a different, much simpler method is applied. The consolidated financial statements thus obtained include assets, liabilities, equity, revenues, expenses and net income of the group, as if it were a self-asserting entity. The major differences between the consolidated financial statements and the sum of the individual financial statements of the group's components come from the restatements generated by bringing to the same common denominator of the numerous accounting options that the component companies have in the individual accounting, from the elimination of the intra-group transactions, from the existence of non-controlling interests. Thus, it is almost impossible for the consolidated net income to be equal to the sum of the net incomes of the group's components - we can appreciate that, most of the times, the consolidated net income is lower, as a result of the elimination of the internal profits and, possibly, as an off-setting of the positive net income of some components with the losses reported by other components.

The accounting consolidation, by providing more relevant financial information about the group, represented a model for the tax authorities, in their attempts to simplify and to make more efficient the taxation of profits. In France, the tax integration regime has been introduced since 1988 (Law 87-1060/1987). Although it does not refer to the consolidation in any way of the profits of the components of the EU groups, at European level, the Directive 90/435 was issued establishing a common tax regime applicable to the parent companies and the subsidiaries of the Member States. This fiscal regime refers to the avoidance of double taxation of the profits paid by the subsidiaries of the parent companies, with a definition of this relationship different from what we find in the accounting: the detention threshold for a company to be a parent is fixed at 25% in Directive 90/345. Subsequent changes in this directive have led the percentage to 20% (valid for 2005 and 2006), so that, since 2007, it will become

15% and, since 2009, to reach 10%. The normative act was rewritten and republished, in an updated form, by another directive (96/2011).

Regarding the fiscal consolidation/integration, the European efforts to introduce a common European tax base for groups that make profits in these territories are well known. Thus, in a report from 2002 (European Parliament, 2002), was proposed the idea of a consolidated common tax base (CCCTB) established by applying a set of unique rules and a mechanism for distributing this base between the different Member States in which where activates the subsidiaries of the respective groups (Fuest, 2008). This proposal was a bit stuck, it was reiterated in 2016, when the European Commission proposed a project of directive in this regard (European Commission, 2016), a project still in work. The situation at the EU level can concern Member States, but these have no obstacle to proposing and applying, at national level, the regime of fiscal consolidation in the area of corporate income tax.

Regarding the value added tax (VAT), the initial version of the European Directive in the field (Directive 6/1977) establishes that anyone is considered an independent manner an economic activity, regardless of the purpose or results of such an activity. Directive 6/1997 allows the member villages to extend the definition of the taxable person to groups of legally independent persons. The explicit formulation appeared in Article 4, Al. 2: " Subject to the consultations provided for in Article 29, each Member State may treat as a single taxable person persons established in the territory of the country who, while legally independent, are closely bound to one another by financial, economic and organizational links". The same text appears in Directive 112 (2006), after which, probably, the Romanian Fiscal Code version was inspired starting with January 1, 2007, the date of Romania's accession to the EU.

We do not have to limit ourselves only to the EU to find regimes of consolidation/fiscal integration, in the sense of establishing a tax at the level of several companies owned by a common shareholder. In the United States there is such a possibility to compensate for the fiscal profits of subsidiaries with the fiscal losses of other subsidiaries held directly or indirectly within at least 80%, with the preparation of a group tax return (Drake, Hamilton and Lusch, 2020).

The purpose of our study is to make a parallel between the accounting and fiscal rules regarding the recognition of the groups of enterprises, as well as the highlighting of the consequences of applying these rules. Also, the possible alignment of the fiscal rules on the accounting ones, regarding the groups, could suggest a closer connection between accounting and taxation; However, the major differences between the manner in which the accounting consolidation is made comparing with the fiscal consolidation, as well as the differences between the definition of the VAT group compared to the corporate income tax group, show us that the current situation is characteristic for an extended disconnection between accounting and taxation.

In the following sections, we present a brief review of the literature, followed by the summary characterization of the Romanian accounting consolidation system and the fiscal implications of the existence of groups: fiscal treatments of transactions with affiliated persons, the VAT fiscal group and the corporate income tax group. Finally, we conclude and present the references.

2. A SHORT LITERATURE REVEIW

It can be considered that the tendency of companies and groups of companies to diminish the amounts they have to pay to the tax authorities is perceived, to a certain extent, as justified and even legitimate (Anesa *et al.*, 2019), especially by some parts involved in economic life. The tax authorities are trying to establish rules that allow the easier and simpler collection of some taxes, but the complexity of these rules can affect how they are understood and applied. The taxation at the level of the groups of enterprises represents one of the objectives declared at the level of the European Union, although the CCCTB project proposed in this regard has not yet materialized, especially, because of the theoretical and technical difficulties of finding some criteria for apportion the tax between the states of origin of the respective profits, but also of the difficulties in finding the consensus of the countries involved; some of them opposing to any political measure that could diminish the possibilities of fiscal planning/optimization through the companies groups (Borotti, Rabasco and Santoro, 2022). Continuation of the CCCTB project and its classification in the new BEFIT strategy (Business in Europe - Framework for Income Taxation), inspired by OCDE proposals, tries to lead to a fair apportionment of the tax between states, to a simplification of administrative formalities, such as submitting a single-tax returns for a group of companies (Velling, 2021), but also at a reduction in fiscal conformity costs (Barrios, d'Andria and Gesualdo, 2020). The effects of such possible rules could be significant, considering the number of groups operating in Europe; a statistic available on Eurostat' s website (Eurostat, 2022) tells us that, in 2020, EuroGroups Register (EGR) had identified 135.450 multinational groups operating in Europe and EFTA (European Free Trade Association) countries, which brought together over 1.2 million companies (of which nearly 500,000 in EFTA) and had over 42 million employees (about 1 in 5 European employees work for such a group). Another argument in favour of such a tax solution can be represented by the tax competition between the European states, especially in terms of corporate income taxes (Broussolle, 2017), a competition that could decrease the level of tax rates, so as to maintain attractiveness for capital in search of placements.

The adoption of accounting rules and, subsequently, the adaptation of fiscal and financial reporting by some states to what is happening in other states can be included in what is called mimetic isomorphism - but also normative and even coercive - (Depoers and Jérôme, 2019).

Not still having European tax rules at the group level with all its components, the individual state tries to perceive taxes on a consolidated basis, at least for companies that act within the limits of national territories.

3. THE EVOLUTION OF THE ROMANIAN ACCOUNTING REGULATION ON THE GROUP CONSOLIDATION

The first version of the Romanian accounting law after 1990 - Law 82/1991 - made no reference to any possible consolidated procedures; it must be said that, at that time, the term of annual financial statements was not used, their equivalent being designated with the term of balance sheet, which included both the actual statement of the financial position and other components, such as the profit and loss account, the appendixes (the current explanatory notes) and the annual report. On the other hand, the detail rules elaborated by the Government in the application of the initial accounting law - the Regulation for the application of the Accounting Law, approved by GD 704/1993 and entered into force on January 1, 1994 - introduce the notion of balances within the group, to which it corresponds to a specific account, in the description of the function of which it is established that it receives in debit and credit the receivables, liabilities, as well as the decreases of receivables and liabilities resulting from transactions, especially financial, with other components of the group. Through the same regulation, a financial non-current assets account is introduced in which to account for participation titles, i.e. the actions and social parts that could give control rights over other legal entities. In turn, the companies' law no. 31/1990, also in its initial version, does not refer to the notion of group based on the control exercised by holding the voting rights.

The Romanian accounting law would be amended many times, until now. In GD 704/1993, art. 3 established the obligation to permanently update the accounting regulations for the Ministry of Finance. By virtue of this obligation, the Ministry of Finance issued an order (OMF 772/2000) by which explicit norms regarding the consolidation of accounts were approved and in which specific notions such as: group, subsidiary, control, significant influence, business combinations, acquisition, date of acquisition, consolidation, consolidated accounts, consolidation perimeter, associated enterprise, equity method, proportional consolidation, minority interest, participation interests. Of course, these notions, like the rules contained in OMF 772/2000 are not original, the order being an adaptation in Romania of the European regulations in the field, especially of the seventh European Directive. We note that, in order to designate what we call today consolidated financial statements, the term consolidated accounts, specific to the European accounting directives, valid at that time, were used. As far as we know, OMF 772/2000 did not apply much by the Romanian companies that fulfilled the conditions for drawing up consolidated accounts, probably because the accounting law did not include any

explicit provision to such an obligation: the republishing of the law of 2000 does not add nothing related to groups.

After several changes in the accounting law and after of its application regulation, the law is republished again in 2002, completing with provisions regarding groups - to art. 10, a paragraph 3 is introduced with the following content "The companies that hold participations in the capital of other companies, hereinafter referred to as group companies, will draw up and present consolidated annual financial statements...". Under these conditions, the consolidation of the accounts, i.e. the preparation of consolidated financial statements becomes a legal obligation.

At the same time, OMPF 94/2001 brings to Romania the international accounting standards, after an attempt from 1999 that was abandoned (OMF 403/1999), but had the merit of familiarizing a little with the logic of international standards and began to prepare us for what was to follow. The companies that have OMPF 94/2001 to apply had, in principle, the obligation to draw up consolidated financial statements, if they had subsidiaries. However, the provisions of OMPF 94/2001 regarding the consolidation were not so imperative, the order stating that if the incident companies do not respect the consolidation obligation, then they will receive a modified audit opinion. We can assume that the consolidation obligation has been respected, at least partially, by the some exposed companies: listed companies with institutional shareholders and/or exigent auditors, Romanian subsidiaries of foreign groups, companies financed by some financial institutions with strict credits and loans conditions, companies in restructuring programs financed by international financial bodies, companies whose Romanian owners had relevant foreign experiences in terms of financial reporting and corporate governance.

This situation lasted until 2005 inclusive. Starting with 2006, OMPF 1752/2005 enters into force, which includes both individual accounting regulations, as well as explicit consolidation rules, according to the model of OMF 772/2000. In the norms valid since 2006, it is explicitly specified that the consolidation rules are in accordance with the seventh directive of the European Economic Communities. The regulations of OMPF 1752/2005 were continued by OMPF 3055/2009. After the emergence and entry into force in the European Union Directive 34/2013, which repeals previous accounting directives (fourth and seventh), the adaptation of the Romanian accounting regulation was made by replacing OMPF 3055/2009 with OMPF 1802/2014. The latter normative act, taking in the title elements from Directive 34/2013, marks an important step in the formal evolution of the Romanian standards - under the influence of the European ones - in the sense that, by its very name, we are suggested, for the first time in a Romanian accounting regulation, that the objective of the accounting standards is represented by the presentation of the financial statements and not necessarily by the current accounting, approaching, from this

point of view, by the international standards. At the same time, the title of OMPF 1802/2014 also includes the explicit reference to the consolidated financial statements, as it appears in Directive 34/2013.

Currently, we can say that there is a complete Romanian accounting referential regarding the preparation of consolidated financial statements, including for establishing the detail rules regarding the identification of the groups, the exceptions from the consolidation, to the concrete consolidation procedures.

The Romanian companies can be divided into at least two categories, from the perspective of consolidation obligations:

1) companies applying IFRS and consolidates accordingly; into this category, we have:

- the credit institutions applying IFRS from 2012; according to the Register of Credit Institutions, managed by the National Bank of Romania, on May 19, 2021, there were in Romania 23 such institutions (National Bank of Romania, 2021); from their sites, for 10 of them we identified, for 2020, explicit consolidated financial statements, although many of them are in turn subsidiaries of some consolidating groups; the other 13 does not report consolidated financial statements, but at least 7 of them are branches of some consolidating groups;
- the companies listed on the regulated market of the Bucharest Stock Exchange (BSE) also apply IFRS from 2012; on the BSE website we find 83 positions on the regulated market, of which we eliminate 3 companies from the international category (they are not registered in Romania), as well as the 3 listed banks (present in the above situation); 77 companies remain, of which 36 presents consolidated financial statements in the 2020 annual reports;

2) companies that apply the Romanian accounting standards (OMPF 1802/2014) and which consolidate according to the provisions of this order: we have no information about the number of those who consolidate in these conditions.

Considering the two major categories of entities presented above, we find that, from the point of view of the consequences regarding the accounting of the income tax, there are significant additional obligations to the application of IFRS - the deferred taxes, in accordance with IAS 12. Consolidation, by switching from individual to group accounting, represents an important source of such deferred taxes, through the adjustments made by homogenizations and specific eliminations. Fortunately, the companies applying OMPF 1802/2014 for the preparation of the consolidated financial statements do not have to deal with the deferred taxes, in the complicated form that IAS 12 imposes.

The main condition to be fulfilled for the recognition of a group of companies with accounting consolidation obligations is to hold the control by a

parent company over one or more subsidiaries. Companies' law (law 31/1990) refers to the accounting law when it reminds of the notion of parent company, in the context of establishing the obligation of its executive management to submit copies of the financial statements to the fiscal authorities (art. 185). In the same law appears the notion of subsidiary, designated as the society being a legal person. These extremely summary clarifications regarding the reporting obligations of the groups oblige us to go to the accounting law (82/1991) to find criteria for identifying groups and for consolidation procedures. In this law we do not identify too many elements regarding the definition of groups, systematically referring to the applicable accounting regulations, that is, in most cases, to OMPF 1802/2014. From this last regulation we find the definition of the parent company - an entity that controls one or more subsidiaries -, of the subsidiary - an entity controlled by a parent company - and of the group - a parent company with all its subsidiaries. Also here is defined the associated entity, i.e. the company in which an investor holds at least 20% of the voting rights. The main characteristic of the notion of control is holding the majority of the voting rights in another entity. There are other criteria, but we can mention here, for now, at this threshold of 50% of the voting rights. There is nothing original within the limit established by the Romanian law, it is taken as such in the European Directive 34. At European level, there are other regulations that establish this limit. For example, in Eurostat (2010) reference is made to the European Accounts system (ESA 1995) in which the control is recognized when more than half of the voting rights is held in an entity.

If we refer to IFRS, the definition of control is much more elaborate, in the idea of catching as many situations as possible. Thus, the control is presumed to exist if one entity has authority on another result from holding participation, if involvement in this entity offers variable rights to its profits and if it has the ability to use its authority to affect the amount of the investor's return. It can be deduced that, here, holding over 50% is a frequent control situation.

4. ROMANIAN REGULATION ON THE TAXATION ON THE GROUPS OF ENTITIES LEVEL

In developed countries, taken individually or grouped in various regional or world organizations, intra-group transactions have represented an important concern for tax authorities, considering the possibilities of using these transactions in the profits shifting to tax havens. The Romanian fiscal norms after 1990 followed this tendency quite late, but we can appreciate that this gap was necessary for learning the notions of modern taxation, both by the authorities and by the taxpayers. We can identify here a few directions of action presented in fiscal laws:

- establishing the rules for identifying the entities between which the transactions can be qualified as transactions with affiliated persons;

- creating the framework for several companies to be associated in a tax group in terms of value added tax;
- introducing the possibility of operation of the fiscal group from the point of view of the corporate income tax.

4.1. Transactions with affiliates

As we could expect, the possibilities of profits shifting between a groups' components have often led to the fiscal declaration of an important part of these profits in tax havens, in the sense that they have small taxes and a good infrastructure necessary for the management of these profits. The states, individually, but also as members of some regional or international organizations, reacted to such fiscal optimization techniques and introduced rules that try to limit revenue losses to national budgets. Doo and Yoon (2020) assure us that profit transfers between affiliated companies can be the optimal fiscal strategy at the level of companies. In this context, we could understand the general perception that governments lose significant amounts as a result of the transfers of profits between the components of the groups, located in different states (Bretin, Guimbert and Matiès, 2002; Delis, Hasan and Karavitis, 2020), especially that around of 40% of the European groups had, in 2021, at least one subsidiary located in a tax haven (Borotti, Rabasco and Santoro, 2022). This perception is even confirmed by serious studies; for example, taking advantage of the obligation introduced for some multinational (with consolidated revenues of over 750 million) to provide individually Country-by-Country Reports (initiated by OECD and G20), Fuest, Hugger and Neumeier (2022) find 82% of large German multinationals as having subsidiaries in tax haven and that these subsidiaries are significantly more profitable than those located in other countries (for Germany, such reports started with 2016); Despite the fact that German groups have businesses in tax havens, the share of profits reported in these areas is only 9% of the consolidated profits, and Fuest, Hugger and Neumeier (2022) estimates that only a maximum of 40% of these profits represents the result of applying fiscal optimization techniques. In their turn, Jaafar and Thornton (2015) confirms that the existence of subsidiaries in tax havens has as statistical effect in decreasing the effective tax rate, both for the listed and private companies.

The transition to the market economy in Romania, started in 1990, also required new tools for taxing the profits of the companies. In the first regulations of this kind - GD 741/1990 and GD 201/1990 there was no reference to any special regime related to transactions with associated or otherwise affiliated entities. Not even in the first law on the income - tax law 12/1991, valid until 31.12.1994 - there is any clarification regarding the transactions between the components belonging to the same group. Only through GO 70/1994 is introduced, through the initial version, a regulation that we can include in the

series of measures to fight the effects of intra-group transactions on the budgetary revenues. Thus, it is established that the tax authorities can audit the operations performed in favour of the associates, shareholders or other persons acting on their behalf, but also that "in the case of transactions between taxpayers or between them and a natural person or an entity without legal personality, who participates in any form in the management, control or capital of another taxpayer or other entity, without legal personality, the value that will be recognized by the fiscal authority is the market value of transactions. The same is true when the taxpayer or the other person or entity are associated, respectively shareholders, and do not have control". Here we find a first attempt to apply the arms' length principle, so present in international discussions on the topics of corporate taxation.

Starting with Law 414/2002 (applicable from July 1, 2002), the intra-group transactions are reserved for a slightly stricter regime of fiscal tracking. It is created the possibility that the tax authorities will recalculate the corporate income tax in several situations, most referring to transactions with or in connection with the affiliates. We also find here the explicit specification according to which, in the transactions with the affiliated persons, the value recognized by the tax authorities is the market value, listing three methods of establishing this market value: the price comparison method, the cost-plus method, the resale price method. It is not about original methods, but about simplified adaptations of some international regulations. It should be noted that, by Law 414/2002, the tax notion of affiliated persons is introduced, establishing the threshold of direct or indirect detention of 20% to identify such a legal person.

The continuation of the preparations for the EU accession also led to the entry into force, from January 1, 2004, of a comprehensive fiscal code, built according to European rules (Law 571/2003). Given that the new code includes several taxes, it establishes a series of common definitions of some fiscal terms. In this definitions part of the code, we find the notion of affiliated persons and the direct or indirect detention threshold goes to 33%. It is maintained according to which in the transactions between the affiliated persons, the tax authorities can adjust the tax base, to take into account the market price; the methods of establishing the market price are those recommended by the OECD. The explicit formulation is "within a transaction between affiliated persons, the tax authorities can adjust the amount of income or expense of any of the persons, as necessary, to reflect the market price of the goods or services provided within the transaction". We note that the adjustment is not mandatory, as long as the formulation "tax authorities can" appears in the text of the law. In addition to this possible limitation of the recognition of prices from transactions with affiliated persons, the initial version of the fiscal code also introduces several other limitations regarding the deductibility of some expenses from such

transactions - is, for example, the case for the depreciation of the receivables. The holding of 33% for the classification in the category of affiliated persons was valid only one year: starting with January 1, 2005, the Fiscal Code is amended and the percentage reaches 25%, still valid today. At the same time, it is maintained that the tax authorities may not take into account the transactions that have no economic purpose and can adjust the income or expenses from transactions with affiliated persons, to reflect the market price.

After the replacement of Law 571/2003 with Law 227/2015, the rule according to which the transactions with affiliated persons must be made at the market price remain valid. Since 2018, the Romanian state has transposed the provisions of a European Directive against Fiscal Obligations Avoidance (ATAD) and has significantly extended the area of possible fiscal limitations generated by transactions with affiliated persons. Thus, returning to the name of associated enterprise - with the definition very close to that of an affiliated person, presented in another title of the code, including maintaining the percentage of direct or indirect holding of 25% - and referring to an inclusion in a group in consolidation purposes, a limitation of the annual deductibility of interest is established, valid only in the transactions between associated persons. On the same occasion, the Fiscal Code also enters the notion of controlled foreign companies with over 50% holding.

4.2. VAT groups

By the Law 343/2006, the notion of fiscal group is introduced for the first time in Romania, to the VAT part of the fiscal code (by adding a paragraph to art. 127). This specification entered into force on January 1, 2007, with the accession of Romania to the European Union (EU). The modification of the fiscal code in this regard introduce in the Romanian regulation some provisions of the specific European Directive. In Law 343/2006, the notion of unique fiscal group is used to designate legally independent persons, but between which there are close financial, economic and organizational links. This group can be considered as a single taxable person, the major advantage representing the possibility to compensate the payable VAT from some components of the group with recoverable VAT from other components. We did not find any information from ANAF or from the Ministry of Public Finance, regarding the number of unique fiscal groups that requested the recognition as such and operated in Romania, starting with 2007.

For the implementation of the notion of VAT fiscal group, the methodological norms for applying the fiscal code state what it means financially, economic and organizational links. Thus, we find the limit of ownership of 50%, directly or indirectly, belong to the same associates/shareholders. We also identify here a removal from the accounting definition of the group. From the point of view of VAT, of at least two

component companies of the group, it is not understood that one would need to hold participations in the other and to play the role of parent society. It is very possible that a natural person (or more) - the same associates - hold over 50% of two companies and only the latter to be members of the VAT fiscal group. As well as one or more legal persons who own over 50% of two other companies, which they make a single tax group, without the group, and the owners.

The components of a unique VAT fiscal group must designate, among them, a representative who becomes an interface in relation to the tax authorities, on issues of value added tax. The members of the VAT fiscal group, except the representative, keep the usual VAT records (sales/purchase journals, various registers, recapitulative statements, etc.), draw up the individual VAT return, which they send to the representative, without paying or receiving any amount representing VAT in the relationship with the fiscal authority. The representative keeps his own individual record regarding VAT, draws up his own VAT settlement and has, in addition, the obligation to put together all the VAT returns of the individual components of the VAT fiscal group, reporting - in this consolidated VAT return - the cumulative amounts of the individual settlements of the VT fiscal group, calculates the amount to pay or to recover, which it settles in relation to the authorities. With the submission of the consolidated VAT return, the representative also submits the individual VAT returns of the group members. The belonging to a VAT tax group is not limited to a unique settlement in the relationship with the Treasury, but also to the solidarity for any VAT due by each other member of the group, for the period that belongs to this group.

From an accounting point of view, the transmission of the VAT payable/to be recovered can be done through the settlement accounts within the group. In the absence of an explicit rule established by law, we can imagine that these settlements are made according to the rules established at the group level, taking into account other transactions between the respective components; It is sufficient to look at the hips of the settlements accounts within the group to see what are the receivables/liabilities to settle between the companies involved in this VAT fiscal group.

4.3. Fiscal groups for income tax purposes

Following the fiscal experiences of Western countries regarding the taxation of the consolidated profits of several companies belonging to the same group (Chazkal, 2019; Gerner and Mosset, 2020; Eloy and Noré, 2022), the Romanian tax authorities entered into the fiscal code a chapter that allows the recognition in Romania of the fiscal group in the field of income tax. We have the opportunity to ascertain other criteria for defining the fiscal group, criteria that do not overlap neither accounting, nor those applied for the establishment of VAT fiscal groups. Unlike France (95%, as in Luxembourg) or Belgium (90%),

the detention threshold is taken into Romania to set up an income tax group tax is 75% (for at least one year), without imposing the existence of a control relationship between the component companies of the group. Thus, if two or more subsidiaries decide to form such a group, it is possible. Also, if two or more companies controlled by a natural person decide to form the group, they have the opportunity to do it. Income tax consolidation represents only an algebraic summation of the tax base component companies, as well as other elements taken in the calculation of the fiscal result: tax credits, reported tax losses (only those obtained after entering the fiscal group), sponsorship, tax reductions related to the investments made, decrease the cost of the electronic cash devices. Of course, the component companies of this type of fiscal group must be Romanian legal persons, paying income tax, have the same fiscal year and not to be dissolved/liquidated. An important restriction established by the current tax law is that such a fiscal group must operate as such at least 5 years. The 75% possession for belonging to an income tax group causes the entities that compose it to be affiliated entities, within the meaning of the fiscal code. The rules establish that each member of the group must draw up a transfer pricing file, which will include transactions with the members of the group but also with the affiliated entities that are not part of the respective fiscal group.

Comparing these initial rules for the recognition of an income tax fiscal group with the situation in other countries, we find that the Romanian authorities have opted, for the moment, for a very simple version of the consolidation of the income tax bases, without assimilating anything from the specific accounting consolidation. Thus, no restatements of the fiscal results transmitted by the group's components, no eliminations of the intra-group transactions is applied. In other jurisdictions, things are somewhat more advanced in the direction of a fiscal consolidation/integration that will resort to some of the procedures of accounting consolidation (Sgara, 2021), in the sense that some operations internal to the group can be eliminated.

5. CONCLUSIONS

The notion of group is used in accounting, but also in financial and fiscal reports. Beyond the natural mimetic behaviour generated by the EU belonging, the option of the Romanian tax authorities to allow the existence of fiscal groups can also be a sign of adaptation to the harsh realities of the tax competition between the European states.

Belonging to a group can have accounting consequences - the involvement in consolidation - but also numerous fiscal consequences - the application of the rules regarding the affiliated persons and the transfer prices, the establishment of fiscal groups in the sense of VAT or for the purpose of the corporate income tax. The different purposes of the accounting regulations against the goals of the fiscal regulations lead to significant differences in the definition of the group, the

component entities, the detention thresholds and the fiscal or accounting consequences. In order to establish the exact framework in which the transfers of fiscal results can be carried out between the components of the fiscal group and the representative or the responsible person, it is very useful to conclude a convention in this regard.

In a centralized form, we will present the main landmarks of these rules comparatively (Table 1).

Considering the possible compensations at the level of the fiscal group, it can be said that the option for such solutions falls in the category of legal tax optimizations within (Menchauoi, 2015). Among the effects on financial reporting, we can think that the decrease of the tax to be paid by compensating for the tax profits with the tax losses transmitted by the group's components can lead to the significant decrease of an indicator used in the analysis of the companies: the effective tax rate, taking into account the taxes paid.

On the other hand, we can wonder if the regime of fiscal group, either at VAT or income tax, helps in any way in better collection of taxes or in reducing the profits shifting to other countries. In the absence of official statistics regarding the Romanian fiscal groups, possibly comprising the taxes paid by them, we cannot affirm anything in this regard. However, from the perspective of business development we can resume the idea that the investment decisions of the large groups are also made according to the taxation regimes in the targeted countries (Devereux and Griffith, 2003): the application of a tax consolidation regime, given that a foreign group can have several subsidiaries in Romania, it can be an additional argument in locating some investments here.

The tax authorities have the information about the tax groups declared as such and can do interesting analyses by calculating an effective tax rate at the level of the fiscal group (in the case of income tax), an effective tax rate to be compared with the 16% statutory rate, but also with the possible effective rates established at the level of each member of the group. These kinds of comparison can lead to a better image on the performances of some groups, on their contribution to the coverage of public spending, on the fiscal pressure they bear (Braz, Cabral and Campos, 2022) but also to the faster identification of less compliant behaviours from the respective companies, especially that it is possible that some such fiscal groups will not report any accounting information at the consolidated level.

Table 1. Accounting and fiscal characteristics of the groups

Characteristic	Accounting group	Affiliated persons, in the sense of the fiscal code	VAT fiscal group	Income tax fiscal group
Detention thresholds	50%, usually, for defining the subsidiaries fully consolidated; 20% for associated entities consolidated by the equity method.	25% hold directly or indirectly by one company in the other or by another person in the companies without direct connection between them.	50% hold directly or indirectly by one company in the other or by a third party.	75% hold directly or indirectly by one company in the other or by a third party.
The obligation to apply the procedure for all companies that meet the group membership criteria	Yes, excepting immaterial subsidiary.	No	No, the group is constituted by option and it is not mandatory for all entities that meet the 50% condition.	No, the group is formed by option and it is not mandatory for all entities that meet the 75% holding condition.
The existence of a parent company with legal personality to deal with consolidation	Mandatory: This parent company draws up and presents consolidated financial statements.	It is not mandatory, anyone - natural or legal person - can directly or indirectly hold the 25%.	It is not mandatory, anyone - natural or legal person - can directly or indirectly hold the 50%. It must be designated a representative to consolidate the individual VAT returns.	It is not mandatory, anyone - natural or legal person - can directly or indirectly hold the 75%. A responsible person should be named to consolidate the individual taxable income.
Restatement of the individual information transmitted to the group	Mandatory: homogenizations are made to ensure the application of the same accounting policies and estimates by the group's components; a whole series of eliminations of the effects of intra-group transactions	It is possible that the fiscal authority may restate some individual information to take into account the market price in the case of transactions between affiliated	No restatements are operated, other than those specific to the transactions between affiliated persons, possible by the fiscal authority; the VAT payable and VAT recoverable from	No restatements are operated, other than those specific to the transactions between affiliated persons, possible to be carried out by the fiscal authority; the individual tax

Characteristic	Accounting group	Affiliated persons, in the sense of the fiscal code	VAT fiscal group	Income tax fiscal group
	and the titles held by the parent in subsidiaries are also operated	persons; These restatements affect the size of fiscal obligations.	the group's components are added, compensating, where appropriate	base, such as the other amounts that contribute to establishing the tax profit, are added. Some components of the individual tax credits can be recalculated.
The possibility of leaving the group	If the percentage of detention is not assured or if the subsidiary become immaterial.	Only if holding descends below 25%.	Yes, a component of the VAT fiscal group can withdraw, even if the percentage does not descend below 50%.	Yes, a component of the fiscal group can withdraw, even if the percentage does not descend below 75%.

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KNOWLEDGE VALORIZATION IN EU. A CRITICAL ASSESSMENT FOR ROMANIA

DIANA-MANUELA LINA

*Alexandru Ioan Cuza University of Iași
Iași, Romania
lina.diana@gmail.com*

Abstract

In this paper we propose a critical assessment of the activities in the knowledge valorization chain in Romania, exploring data from 2021 European Innovation Scoreboard (EIS). Using a set of relevant indicators, we analyse the main dimensions of capturing the value creation from knowledge.

Knowledge valorization lies at the heart of the knowledge economy and is critical for the economic and social progress. Despite of the political efforts of the European Commission regarding this issue, the “European Paradox” continues to exist and the failure of most European countries to convert the investment carried out in R&D into economic results and social benefits remains a debated topic.

Universities, as one of the main actors of the knowledge valorization process acknowledge this as a component of the university mission and play multiple roles along the valorization channels. In this context, the entrepreneurial transformation of the university is determined and determines support and intensification of knowledge transfer.

The research shows the need to reduce barriers for transferring knowledge into economy and necessity for policy intervention to uptake of research results in society and the economy, especially for Romanian environment.

Keywords: knowledge valorisation; entrepreneurial university; innovation.

JEL Classification: I32, O32, O38

1. INTRODUCTION

European Union is dedicated to achieving sustainable development principles. In 2015, the UN 2030 Agenda for Sustainable Development set out 17 goals in a global effort to address the world challenges. European Union adopted the principles of the sustainable development since 2001, when the first European Union Strategy for Sustainable Development was adopted at the E.U. Summit.

Later, in 2016, the European Commission developed the European Action for Sustainability, in compliance with which the E.U. SDG Multi-stakeholder Platform was established in 2017.

In this context, mission-oriented Research and Innovation is one of the transformations for EU achieving the UN Sustainable Development Goals

(Eurostat, 2019). On another side, innovation policy is crucial for EU becoming a world innovation leader and outperforming its main competitors, USA and Japan. Investing in R&D as a major driver of innovation is critical. Still there are discrepancies between E.U. countries regarding R%D intensity. For example, in 2020 Belgium and Sweden recorded the highest intensity at 3.5% and at the opposite scale six member states recorded a R&D intensity below 1% of GDP: Romania, Malta, Latvia, Cyprus, Bulgaria and Slovakia (Eurostat, 2021).

Despite of the efforts for investing in R&D, there is a failure in the capacity to convert research output into successful innovations in the market. This is encapsulated in the concept of “European Paradox”, coined by European Commission in Green Paper of Innovation, in 1995 (Eurostat, 1995). The document emphasizes the need of utilization of top-level European research by industry. The contradiction between European leadership in scientific production and the limited innovation performance explained by this paradox is generally considered best addressed through improved knowledge transfer and knowledge valorization processes (Van Vught, 2009).

However, there are researchers questioning the theory regarding this paradox (Dosi, Llerena and Labini, 2006; Rodriguez-Navarro and Narin, 2010). Their main argument could be resumed at the fact that the quality of research publications counts more than the high volume of scientific research. The concern for the European paradox was maintained in the policy documents of E.U. which are recently emphasizing that “even if the Union continues to be a global leader in terms of scientific output producing, for example, 22.7 % of all high-quality scientific publication, still lags behind in translating this advantage to the market” (European Commission, 2020).

Research and Innovation systems are performing based on top-level science producing relevant output, business involved in innovation activities and also on supporting policies conducive to thriving science-industry knowledge transfer relationship. Universities play an important role in research and innovation systems. The process of knowledge valorization is starting with universities (Hladchenko, 2016). The traditional functions related to education and research are enriched and complemented with a third mission, for commercialization activities, patenting licensing and company formation. (Rasmussen, Moen and Gulbrandsen, 2006). The model of Triple Helix (Etzkowitz and Leydesdorf, 1995) consider universities together with industry and government as „helices” generating the innovation system. Due to the impacts on society the entrepreneurial profile of universities become a factor for stimulating innovation and for promoting the uptake of research and innovation results.

In this paper, data for Romania and “emergent countries” extracted from the European Innovation Scoreboard are used to illustrate the main dimensions of capturing the value creation from knowledge. Also, we analyse the role of

universities in knowledge valorization chain and the need for policies to enhance the activities stimulating the transfer of knowledge into goods and services.

2. CONCEPTUALIZATION

The process of transfer the knowledge to society, through transformation of knowledge to valuable products and services is subject of numerous studies. Knowledge valorization is a broad concept with multiple manifestations such as: "licensing of a patent to a firm, university-business collaboration to elaborate an invention to bring it to market, graduates working in research departments in the business sector, and spin-off firms engaged in developing an invention" (Van Geenhuizen, 2010), knowledge exploitation, knowledge or technology transfer, knowledge exploitation and academic entrepreneurship (Van de Burgwal, Van der Waal and Claassen, 2018), the transfer of knowledge from one party to another for economic benefit (Andriessen, 2005). There are three major paths of exploration regarding the concept of transforming knowledge in universities to economic value: knowledge valorisation, knowledge commercialization and knowledge capitalization (Baycan and Stough, 2013). The transformation stages can be considered as constituent elements of a value chain. Porter sought to define competitive of a firm using the concept of value chain. The goal of the activities within a value chain is to create value that exceeds the cost of performing that activity, therefore generating a higher profit (Porter, 1985).

Similar to Porter's value chain approach, a knowledge value chain is consisting of knowledge management infrastructure, knowledge management activities and knowledge performances (Lee and Yang, 2000).

The impact of research valorization and innovation for economy and social life determined the scholars to design conceptual models for a clear representations of knowledge valorization. The process of university knowledge valorization is not linear and homogenous. The diversity in models show that knowledge valorization, and specifically university-based innovation, is hard to define, comprising multiple heterogeneous subprocesses and associated activities with potential contribution role in the process of achieving societal impact (Van de Burgwal, Van der Waal and Claassen, 2018).

Among the participants in the valorization process are university faculty members, university technology officers, firms and entrepreneurs, consumers, and policymakers (Siegel and Wright, 2015). In addition to their traditional roles of education and research, universities are engaged in establishing links with industry, which made them to evolve „into fully fledged managerial organizations preoccupied with generating profits and creating an economic impact on local, regional and national scales" (Budyldina, 2018).

Preoccupation for valorisation of research is one of the phases of becoming an entrepreneurial university, when the universities are taking an active role in commercializing the intellectual property arising from their activities

(Etzkowitz, 2017). However, the valorization process is confronted with some barriers. Among them there are: bureaucracy and lack of flexibility in University-Industry relationship, insufficient rewards for researchers (Siegel *et al.*, 2004), constraining university-industry collaboration because of cognitive-distance, differences in value systems between university and industry, shortcomings in financial planning and market conditions (Baycan, 2013).

One conclusion is there are two necessary conditions for knowledge valorization: the transfer of knowledge and economic benefit. (Baycan and Stough, 2013). The concern for “European paradox” meaning “inferiority in terms of transforming the results of technological research and skills into innovations and competitive advantages” (European Commission, 1995) is reflected in policy instruments adopted by E.C., for instance:

- the elaboration of the Recommendations on the management of intellectual property in knowledge transfer activities and Code of Practice for universities and other public research organisations (European Commission, 2008);
- the EU Knowledge Valorization Platform launched in 2021, as one of the actions under the new European Research Area (ERA) Communication. The platform is a digital space aiming to stimulate cooperation across the borders and improve the transfer of the research results to economic and social life.
- the policy review ‘Knowledge valorisation channels and tools’ as the first milestone in setting out a European knowledge valorisation strategy published in July 2020. It describes the different means for:
 - improving the transformation of research results into new sustainable solutions;
 - identifying and analysing the main channels for the uptake of research and innovation results;
 - get better at spreading excellent national practices;
 - highlight best practices from Europe and beyond.

The Communication on ‘A new ERA for Research and Innovation’ calls on the Commission in consultation with Member States and stakeholders to update and develop guiding principles for knowledge valorisation and a code of practice for the smart use of intellectual property (IP). Since the first edition in 2001, European Innovation Scoreboard is intended to be a measurement framework for research and innovation performance of the EU Member States. EIS is integrating indicators are assessing the position of individual countries in terms of innovation, which can reflect knowledge valorisation process.

3. DATA

The Summary Innovation Index measures the performance of EU national innovation systems and is quantified by a composite indicator aggregating 32

indicators which illustrate four main types of activities: Framework conditions, Investments, Innovation activities and Impacts. According to the EIS (Hollanders, 2021) there are four performance groups:

- Innovation Leaders includes four Member States where performance is above 125% of the EU average. The Innovation Leaders are: Belgium, Denmark, Finland and Sweden.
- Strong Innovators includes seven Member States with a performance between 100% and 125% of the EU average. Austria, Estonia, France, Germany, Ireland, Luxembourg and the Netherlands are Strong Innovators.
- Moderate Innovators include nine Member States where performance is between 70% and 100% of the EU average. Cyprus, Czechia, Greece, Italy, Lithuania, Malta, Portugal, Slovenia and Spain belong to this group.
- Emerging Innovators include seven Member States that show a performance level below 70% of the EU average. This group includes: Bulgaria, Croatia, Hungary, Latvia, Poland, Romania, and Slovakia.

4. ANALYSIS AND DISCUSSION

The analysis considered benchmarking Romania against the countries from the “Emerging Innovators” (Hollanders, 2021) using specific indicators for each dimension, as illustrated in Table 1.

The dimensions and associated indicators related to the activities in the value chain are illustrated as follows: in Table 2 for “Framework conditions”, in Table 3 for “Investments” and “Innovation activities” and in Table 4 for “Impacts”.

Table 1. EIS selected indicators

Type of activity	Dimension	Indicators	Activity in the KV chain
Framework conditions	Human resources	1.1.1 New doctorate graduates (in STEM) 1.1.2 Population aged 25-34 with tertiary education	Knowledge acquisition
	Attractive research systems	1.2.1 International scientific co-publications 1.2.2 Top 10% most cited publications 1.2.3 Foreign doctorate students as a % of all doctorate students	
Investments	Finance and support	2.1.1 R&D expenditure in the public sector	Knowledge processing

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Type of activity	Dimension	Indicators	Activity in the KV chain
		2.1.3 Direct government funding and government tax support for business R&D	
Innovation activities	Linkages	3.2.2 Public-private co-publications	Knowledge dissemination
Impacts	Employment impacts	4.1.1 Employment in knowledge-intensive activities	
	Sales impacts	4.2.1 Medium and high-tech product exports 4.2.2 Knowledge-intensive services exports 4.2.3 Sales of product innovations	

Source: European Innovation Scoreboard 2021 (European Commission, 2021) and own elaboration

Table 2. Selected indicators for “Framework conditions”, Emerging Innovators

Country	1.1.1 New doctorate graduates	1.1.2 Population with tertiary education (Regional)	1.2.1 International scientific co-publications (Regional)	1.2.2 Scientific publications among the top 10% most cited (Regional)	1.2.3 Foreign doctorate students as a % of all doctorate students
Slovakia	77.02	127.27	101.07	41.83	61.32
Bulgaria	42.56	73.55	47.61	15.78	46.26
Croatia	42.56	96.69	107.43	32.08	57.90
Hungary	31.07	56.20	85.94	48.74	123.03
Latvia	19.58	165.29	90.39	39.37	63.20
Poland	19.58	162.81	69.72	43.58	13.47
Romania	19.58	14.05	47.41	39.84	28.45

Source: European Innovation Scoreboard 2021 (European Commission, 2021)

Table 3. Selected indicators for “Investments” and “Innovation activities”, Emerging Innovators

Country	2.1.1 R&D expenditure in the public sector	2.1.3 Direct government funding and government tax support for business R&D	3.2.2 Public-private co-publications
Slovakia	35.09	27.83	84.82
Bulgaria	15.79	6.84	51.81
Croatia	68.42	4.22	126.94
Hungary	31.58	174.72	111.35
Latvia	50.88	5.77	88.45
Poland	54.39	86.92	71.15
Romania	3.51	14.47	51.81

Source: European Innovation Scoreboard 2021 (European Commission, 2021)

Table 4. Selected indicators for “Impacts”, Emerging Innovators

Country	4.1.1 Employment in knowledge-intensive activities (Regional)	4.2.1 Exports of medium and high technology products	4.2.2 Knowledge-intensive services exports	4.2.3 Sales of new-to-market and new-to-firm innovations (Regional)
Slovakia	70.67	142.19	44.14	83.6
Bulgaria	65.33	50.91	57.93	42.05
Croatia	81.33	64.34	7.95	85.83
Hungary	86.67	143.53	72.02	63.35
Latvia	70.67	45.33	74.84	59.4
Poland	65.33	88.49	57.05	42.8
Romania	25.33	110.44	64.88	62.97

Source: European Innovation Scoreboard 2021 (European Commission, 2021)

Analyzing the data for Romania these are indicating the weakest position for the most part of dimensions from the “Framework condition”: “New doctorate graduates (in STEM)”, “Population aged 25-34 with tertiary education” “Population aged 25-34 with tertiary education”, “International scientific co-publications”. Better ranking inside the Emerging Innovators group

are for “Scientific publications among the top 10% most cited” and “Foreign doctorate students as a % of all doctorate students”.

For “Investment dimension” Romania is ranked before Latvia and Croatia regarding “Direct government funding and government tax support for business R&D”. Despite of the low results in the „input” chain, Romania’s strengths are in “Exports of medium and high technology products”, “Knowledge-intensive services exports” and “Sales impacts”.

5. CONCLUSIONS

There is widely recognized the importance of knowledge as a driver of innovation, economic and societal progress. To measure the turn of innovation inputs into innovative outputs, a large set of indicators aiming at measuring the output from innovative processes was created. European Innovation Scoreboard is a framework using specific indicators for assessment of the position of individual countries, in terms of innovation. We find that the performance of the EU innovation system, measured as the weighted average of the performance of the innovation systems of all 27 Member States, improved by more than 12 percentage points over the eight years from 2014 to 2021.

Within the Emerging Countries group, for 2021, Romania has the lowest value of the innovation index from EU countries, 35.09. Comparative with Sweden which has 156.45, Romania is an emerging Innovator. Based on the assessing indicators and the dimensions related to the activities in the value chain, Romania has the following weaknesses: on both stages of knowledge acquisition and processing the performance is poor, has one of the less attractive research systems from Europe and one of the lowest levels for R&D expenditures in the public sector (3.51 comparing with 156.14 score for Denmark). Despite of the low results in the „input” chain, Romania’s strengths are in “Exports of medium and high technology products”, “Knowledge-intensive services exports”, and “Sales impacts”.

The European Paradox acknowledge the fact that effectiveness of public subsidies for research investments is not translated into successful innovations in the market. Some of the barriers to knowledge valorisation identified in relevant literature are concerning the following aspects:

- Lack of initiatives for facilitate and foster knowledge commercialization;
- Limitation of university-industry collaboration due to cognitive distance, differences in university-industry value systems, deficiencies in financial planning and market conditions;
- The bureaucracy and inflexibility of the University-Industry relationship which is also causing insufficient rewards for the researcher’s work.

In this context, it is necessary to improve policies stimulating the knowledge valorisation process.

Recent support actions undertaken by the European Commission include developing the Code of Practice for researchers on standardisation in the course of research projects funded by Horizon 2020 (European Commission, 2022), launching in 2022 a community of practice for stakeholders to promote Intellectual Property (IP), as part of the European Research Area's Policy Agenda, and defining the European knowledge valorisation strategy (European Commission, 2020).

Future research will address the relation between process and outcomes within the knowledge valorization process of university.

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CONSUMER IN CYBERSPACE: DISCLOSURE OF PERSONAL INFORMATION

ADRIANA MANOLICĂ

*Alexandru Ioan Cuza University of Iași
Iași, Romania
manolica@uaic.ro*

IOAN-CRISTIAN PURAVU

*Alexandru Ioan Cuza University of Iași
Iași, Romania
puravu.ioan@feaa.uaic.ro*

LORIN-MIRCEA DRĂGAN

*Alexandru Ioan Cuza University of Iași
Iași, Romania
lorin.dragan@feaa.uaic.ro*

TEODORA ROMAN

*Alexandru Ioan Cuza University of Iași
Iași, Romania
throman@uaic.ro*

Abstract

The GDPR set of regulations made us more aware of the importance of collecting, protecting, and using personal data. Four years after the effective implementation of GDPR in the Romanian legislation, we focused on investigating the public perception of how various companies store private data online. Besides, we wanted to understand to what degree the public is concerned about handling this data. We realized our research on a sample of the adult population, aged between 18 and 65, all residing in the Northeast region of Romania.

A series of information is processed, accessed, shared, sold, and bought, sometimes even abusively manipulated, all this without the user being aware.

Any online interaction involves private data and digital traces. It could be simple communication, online shopping, or browsing. This data generates new information on our lives and activities. If we look closer at this phenomenon, we realize it only expands with time. Therefore, the question of private life, far away from this potential threat of data manipulation, hidden interest, and unpermitted intrusions becomes more and more relevant.

Our work explores the internet users from the North-eastern region of Romania's behaviours and perceptions four years after GDPR legislation was passed.

Keywords: *GDPR; personal data; online privacy; online identity; personal data protection.*

JEL Classification: D18, M31, P36, P46

1. INTRODUCTION

Online interaction such as communication, online shopping, or browsing leave behind a large amount of data and digital traces. This data generates new information on our lives and activities. If we look closer at this phenomenon, we realize it only expands with time. Therefore, the question of private life, far away from this potential threat of data manipulation, hidden interest, and unpermitted intrusions becomes more and more relevant.

There are a series of interpretations when it comes to internet confidentiality. Most definitions focus on the individual having the right to control his private data. Each time a website collects data without the user's consent, it commits a breach of privacy concerning his life. Many companies can presently collect data at a very low cost. This is concerning for users since those companies can store, manipulate, and manage all this data.

Several studies show that online security-concerned consumers develop often negative online consuming behaviour. Ratnasingam, Pavlou and Tan (2002) showed that 52% of online consumers abandoned the intended online acquisition once confidentiality concerns appeared. Apparently, 30-40% of online users do provide fake data about themselves to keep their online anonymity, avoid spam and prevent usage of their private data by various entities (Hoffman, Novak and Peralta, 1999). An immediate consequence of this behaviour is that a large part of the data is incorrect. This leads to increased cost and lower reliability of this data (Gellman, 2002).

For increased transparency, the websites could inform the visitors what kind of data are collected and the possibility to modify incorrect data or eliminate that data the user does not wish to be stored. In this manner, the consumer could be in control of his private data, and he could be protected from undesired data collection (Tavani and Moor, 2001).

A key concept when approaching private data is the possibility to identify a person. The algorithms for revealing and identifying were studied from a technological point of view (Purtova, 2018).

One of the new measures to regulate the data confidentiality and protection was the implementation of GDPR. Once the General Data Protection Regulation was implemented in the European Union, all companies dealing with European citizen data needed to change the way this data was collected and processed. One of the main objectives of this regulation was to empower the European citizen to control their data in the online environment.

GDPR was officially enacted on May 25, 2018. Consequently, all companies dealing with European Citizen Data needed to update their online confidentiality policies. The aftermath of this found the consumers more motivated to claim their rights regarding the data processing and require more transparency. Our research aimed at investigating the perception about private data security of Romanians aged 18-65 and residing in the North-eastern region of the country.

2. LITERATURE REVIEW

The companies hiring personnel from the European Union are responsible in dealing with their private data. These companies need to be efficient when dealing with this type of data of consumers and employees alike. They also need to be able to erase all this data using advance systems or upgrading the existing ones. The first stage in performing this task is to identify all private data from all sources used for collection. The next step is to implement systems that search on all platforms such data, identifying and collecting them. In absence of proper software tools capable of performing this task, the companies are not able to locate all private data of an individual (Li, Yu and He, 2019).

Many organizations proceeded to modify their confidentiality policies to avoid fines and other sanctions. Although the public communication regarding penalties was deemed sufficient, a significant number of organizations are still lagging when it comes to updating their respective data protection policies to meet GDPR requirements (Zaeem and Barber, 2020).

IoT (Internet of things) represents another dimension to be considered. Due to its fast growth, its investments are also relevant. IoT collects an impressive amount of data to match the needs of individual consumers such as location data, health data, and others. IoT is defined by interconnected services adapted to each person (Wachter, 2018). Devices and services are supposed to exchange user data constantly to supply those users with personalized, tailor-made services. Given the enormous amount of data, the operators collecting it can profile a user and this tends to be seen as invasive, undesired, or unexpected. All these were impacted by GDPR to different degrees.

In the past, various companies used private data unethically and this led to consumers' concern, and this affected their trust (Midha, 2012). A Capgemini-generated report mentions that 39% of online buyers spent more when they know their private data is properly protected (Capgemini Research Institute, 2018). In other words, if the companies benefit from the consumers' trust this translates into a sales increase, therefore this trust becomes a competitive advantage. Trust in the online environment is essential and the lack of trust leads to uncertainty (Mayer, Davis and Schoorman, 1995).

Each online interaction leaves behind data that are collected, analyzed, stored, and processed. The users are also concerned about new viruses, spy

software, and other similar threats and consequently, they are increasingly aware of their online interactions.

In the pandemic context, it seems that an increased interest in online data privacy emerged. There was a set of data regarding location mostly used by the state to enforce surveillance on infected people, social distancing, and other Covid-related measures. This led to the consumers becoming increasingly aware of the overall importance of their online private data in the context of tracking and tracing apps (Malgieri, 2020). This brings into the discussion another topic approached in literature, namely the deployment of artificial intelligence and its impact on data privacy. There is a quest for bringing in a more trust-based approach focused on human values rather than leaving artificial intelligence alone for marketing and technological-oriented use (Weber, 2020).

In the light of the Cambridge Analytica scandal, when 87 million users' data have been released without consent and a record-breaking fine of 5 billion USD was ultimately imposed on Facebook, the public concern with online privacy only mounted (Hu, 2020). Although it had more to do with targeting voters than consumers, we could see a similar pattern in black boxing the voter, and data manipulation came under increased scrutiny on behalf of the FTC (Federal Trade Commission) in the United States (Hu, 2020).

The discussion around the European GDPR mechanism in this context arose with some authors supporting the idea that the GDPR model is outdated. It is mostly because the model is based on the principle of information sharing among 2 parties, or in the online environment, there are multiple actors having access to information. Besides companies, we could deal with "independent infringement" when privacy becomes a peer-to-peer concern (Kamleitner and Mitchell, 2019).

The authors are suggesting a fourth principle besides the 3R's of GDPR (realize, recognize and respect), namely shifting the focus from the user to the sharers. Whoever shares the information of other users bears an equal if not an even higher responsibility. This approach is confirmed by further research into the legal gaps for the controlling of companies such as Cambridge Analytica which need to be prevented from using global data without users' consent (Grishina, Boldyreva and Duysembina, 2019).

The psychographic targeting used by Facebook and other social networks alike is another chapter of interest when it comes to online data privacy. The debate is whether this is ethical or not and the suggestion on behalf of some authors would be to give individuals better control over their data. In this way, the user consent could be considered as granted and the psychographic targeting would not be un-ethical any longer (Gibney, 2018).

3. RESEARCH DESIGN

The general objective of this research was to find the online consumers' perception of how their private data is stored and their concerns regarding how their private data is used. We also wanted to assess the degree to which personal data privacy (confidentiality policies, security policies, storage, and collection transparency) impacts the online consumers' experience.

The research objectives were:

- O1: Identifying the online private data protection interest of online consumers aged 18-65, living in the Northeastern region of Romania;
- O2: Identifying the private data protection online behaviors for consumers aged 18-65, residing in the Northeastern region of Romania;
- O3: Identifying the online private data protection concerns of online consumers aged 18-65, living in the Northeastern region of Romania.

We proceeded to formulate the hypothesis based on research conducted by Buchanan *et al.*, (2007). He was interested in the development of measures of online privacy concern and protection for use on the Internet. He created a measuring scale for robust and reliable evaluation of online behavior based on privacy perception. We used this construct as a starting point and formulated the following hypotheses:

- H1: There is a correlation between privacy concerns when using the internet and the risk of an e-mail containing a scam link to a fraudulent site (Buchanan *et al.*, 2007);
- H2: There are differences between men and women in terms of concerns regarding unknown persons breaching online data privacy (Buchanan *et al.*, 2007);
- H3: There is a correlation between the fact that an e-mail could be read by someone else than the person intended to receive it and the concern about an e-mail being sent to someone can be forwarded to someone else (Buchanan *et al.*, 2007);
- H4: There is a correlation between online privacy concern and online identity theft (Buchanan *et al.*, 2007).

We used the online survey for our research. The first three sections of the questionnaire were taken over from the scale developed by Buchanan *et al.* (2007). The last section of the questionnaire consisted of demographical questions.

To ensure the clarity of the questions and the clarity of the questionnaire overall, we pretested it on a sample of 20 persons. We analyzed a series of information during the pretest: the average questionnaire completion time (5 minutes), respondents' feedback, and a clear understanding of the questions and terms used. No modifications were deemed necessary after the pretest.

The questionnaire consisted of 4 sections: general questions, technical data protection, privacy concerns, and demographic information. The section

including the general questions consists of 6 questions, the technical data protection another 6 questions, the privacy concerns section consists of 16 questions and the last one consists of 5 statements. The questions belonging to the first 3 sections were interval type with 4 measuring steps.

The sample consisted of inhabitants from several counties in the Northeastern region of Romania (Suceava, Botosani, Neamt, Iasi, Bacau, Vaslui, Vrancea, and Galati) aged 18-65. Our sample consisted of 514 persons. Answers received from rural areas accounted for 51.75% of total responses (266 persons), while answers originating in urban area represented 48.25% of total responses (248 persons).

In the rural area, from a gender perspective, the female respondents formed a majority (148 answers, corresponding to 55.63% of total rural respondents). The male respondents accounted for 44.73% of the total respondents or 118 persons. In the urban environment, male respondents were a majority with 52% of the answers corresponding to 129 persons, while female respondents accounted for 48% of the total respondents, corresponding to 119 persons.

The largest number of answers was recorded from the county of Iasi, respectively 21% or a total of 108 respondents. Iasi is the economic and cultural capital for the region and has the largest population. The rest of the counties accounted for 10-13% of the total answers.

The most frequent age interval was 18-24, bearing a large percentage of the sample, namely 68.1%, followed by the age interval 25-34 with 25.7% of the answers and 35-44 with 4.7%. This shows that the young were more inclined to access and fill out the questionnaire.

Out of all participants, 41% had an employee status while 39% were students. Both large groups used the Internet frequently and were familiarized with the theme of our research.

The questionnaire was published on 2 Facebook groups, relevant for each county. The Facebook groups were selected according to their number of members and relevant content for the public aged 18-65.

4. FINDINGS

4.1. O1: Identifying the online private data protection interest of online consumers aged 18-65, living in the Northeastern region of Romania

H1: There is a correlation between privacy concerns when using the internet and the risk of an e-mail containing a scam link to a fraudulent site (Buchanan *et al.*, 2007).

We concluded after analyzing the research results that there are gender differences when it comes to unknown people accessing online private data. Simple actions such as using a credit card to pay, posting a picture on Facebook, using a smartwatch which collects sleep data, sports activities, location, and

others make using the online environment without leaving traces impossible. Many people realized this, and we could see it confirmed through our hypothesis corresponding to Objective 1.

H3.0 (null): There is no correlation between privacy concerns when browsing the internet and the risk of an e-mail containing a scam link to a fraudulent site (Buchanan *et al.*, 2007).

H3.1 (alternative): There is a correlation between privacy concerns when browsing the internet and the risk of an e-mail containing a scam link to a fraudulent site (Buchanan *et al.*, 2007).

There is a direct and reasonable correlation between the 2 variables since Pearson r-correlation = 0.503. Besides, having a $p = 0.000 < 0.05$ reflects a strong statistical significance, therefore we reject the null hypothesis H3.0 and accept the alternative hypothesis H3.1 which infers there is a correlation between the 2 variables. The more concerned about online privacy the consumers are, the more aware of various threats they become (phishing e-mails, malware, and others). Quite often, respondents admitted being victims of phishing attacks. The attackers got access to their private login data and online accounts. They lost money and access to various accounts, and this led to them considering emails with links as being unreliable. Google has an automatic detection system for suspicious links and that mail is sent automatically to spam. Despite all this, there is a growing number of reliable institutions' web pages being cloned to mislead users. The users are often bypassing the verification of information and so they are tricked by the online attackers. In a conclusion, various companies need to rely on solid and reliable marketing e-mail platforms and software to offer a secure online environment and to motivate users to follow the links they send.

Few interesting results after processing the answers corresponding to the first section of the questionnaire were:

Only 20.2% (104) of the respondents mentioned they cared significantly about their confidentiality and destroy documents containing personal data before disposing of them. On the opposite, 27.2% (140) stated they never destroy their private documents before disposing of them.

6.4% (33) mentioned they never hide the PIN of their credit card when using it, 20% (103) are hiding it rarely and 45.5% (234) hide their PIN code most of the time while 28% (144) hide it all the time.

With an average of 2.73 on a scale from 1 to 4, we can notice that the users register only on websites clearly stating their privacy policy. It shows that consumers feel safer regarding their private data when they are aware of the privacy policy including being aware of the storage and usage of this data. This leads to a perception of increased reliability.

Despite all of this, the users are rarely reading the online data privacy policy (average = 2.11). It shows that online users feel safer when they

acknowledge there is a privacy policy, but they are not necessarily reading it. The existence of this online privacy policy is more relevant than its content.

Very few online consumers (13.8%) read all the clauses listed by companies as part of their privacy policies.

Conclusions regarding objective 1 were that people attach great importance to the existence of the privacy policy on the sites. They feel safe when it exists and if they had to choose between a site that has a privacy policy and one that does not, they would most often choose a site that has a privacy policy. They also place value on the security of the credit card's PIN code. Most people have stated that they hide their pin code when they shop or when they are at the ATM. This shows they feel insecure and worried that they might be harmed if someone were to view their pin code. Therefore, methods need to be developed to minimize this concern to motivate consumers to pursue credit card purchases at the expense of cash payments. Regarding the disposal or destruction of personal documents, here the camps are divided, there are people who pay attention to this fact and people who are not worried at all. This decision depends very much on the type of document and the place where this action would take place.

4.2. O2: Identifying the private data protection online behaviors for consumers aged 18-65, residing in the Northeastern region of Romania

H1: There are differences between men and women in terms of concerns regarding unknown persons breaching online data privacy (Buchanan et al., 2007).

H2.0 (null) There are no differences between men and women in terms of concerns regarding unknown persons breaching online data privacy.

H2.1 (alternative) There are differences between men and women in terms of concerns regarding unknown persons breaching online data privacy.

After testing the hypothesis, we concluded that the null hypothesis was not rejected, because the value of the significance threshold for the Levene test is $p = 0.091$ and the value of the Levene test is 2.859, which means that there are no differences between men and women in terms of the concern that strangers may obtain personal data from online activities. At the same time, the value of the t test is 1,750, and the value of the significance threshold is $p = 0.081$, which means that there are no significant differences between the averages of the answers provided by men and women. Regarding the concern about online identity theft, 68.2% of females stated that they are very worried, while the concerned male respondents' percentage was 52.6%. Also, 25.7% of respondents stated that they are concerned to a small extent, 9.1% to a very small extent, and 4.5% not at all.

Another hypothesis tested as part of the second objective is the following:

H3: There is a correlation between the fact that an e-mail could be read by someone else than the person intended to receive it and the concern about an e-mail being sent to someone can be forwarded to someone else.

H3.0 (null): There is no correlation between the fact that an e-mail could be read by someone else than the person intended to receive it and the concern about an e-mail being sent to someone can be forwarded to someone else.

H3.1 (alternative): There is a correlation between the fact that an e-mail could be read by someone else than the person intended to receive it and the concern about an e-mail being sent to someone can be forwarded to someone else.

The results regarding the testing of this hypothesis showed the value of the Pearson coefficient $r = 0.74$, so there is a direct and strong correlation between the two variables. Also, $p = 0.000$ which is lower than the significance threshold of 0.05, hence the statistical correlation is strongly significant. At the same time, it results that we reject hypothesis H3.0 (null) and admit hypothesis H3.1 (alternative), which states there is a connection between the 2 variables. Accepting the alternative hypothesis involves that people are concerned about the reading of e-mails by other people, except the recipient, and that the e-mail may be forwarded inappropriately to other people, a reality we also encounter in daily life.

Some results obtained from the interpretation of the answers corresponding to the questions related to the second objective are:

- With an average of 2.98, we can say that most of the time consumers are attentive to the ways in which they can control their online presence. Consumers use these methods to either abandon offers that are no longer interesting to them or to sign up for various promotions. Everyone chooses based on what they think is best for them. Therefore, it is good for companies to make both options available to consumers (subscribe or unsubscribe), because customers are careful and may feel outraged if one of these options is missing.
- With an average of 2.73, we can say that most respondents prefer to clear the cookies. Consumers believe that these cookies may lead to a lower level of privacy and are associated with items that should be removed. Another conclusion would be that people do not understand the usefulness of these small files, which are harmless and help companies create consumer profiles. Many of the definitions are not understood by everyone regarding the importance of cookies, hence the fear among users. One possible solution would be to explain to everyone the reason why people should agree on the use of cookies and how they can help create a pleasant online experience.

- The average of 2.99 shows that most people block pop-up windows by various methods. The reason people block them is because they are intrusive in many cases.
- With an average of 2.49, it appears that checking spyware is rarely done.
- 2.54 on average for periodically deleting browser history suggests that people are not worried that someone might find out which sites they have visited, or which pages they visit most often.

Conclusions of Objective 2 were that, when identifying the private data protection online behaviors for consumers are aware of many elements that could disrupt their online experience. They adopt a defensive behavior, they often block the cookies of the websites, in order not to surrender data that would classify their behavior as part of a commercial profile. They pay attention to what data they receive from other people in the online environment. For example, most respondents subscribe or unsubscribe from certain offers / promotions, depending on how much value they bring to each of them. Consumers emphasize the possibility of unsubscribing or subscribing to emails or offers. At the same time, most of them block pop-up windows because they are disturbed by them and do not consider them useful. Most of the time, these bring frustration among the users. Companies should study where to place these types of pop-up windows and for what products and services. Each category of users may react differently to pop-up windows. As for the history of their browsers, they are not worried that a record of pages accessed remains, as most of them have stated that they delete it on very few occasions. Another very important result is that there are still many users who never check their computers for spyware, or they only do it on very few occasions, which makes it much easier for malicious people or software to access personal data. The population needs to be educated about online security to reduce the security risks related to personal data on every device.

4.3. O3: Identifying the online private data protection concerns of online consumers aged 18-65, living in the Northeastern region of Romania.

H4: There is a correlation between online privacy concern and online identity theft (Buchanan *et al.*, 2007).

H4.0 (null): There is no correlation between online privacy concern and online identity theft.

H4.1 (alternative): There is a correlation between online privacy concern and online identity theft.

The resulting Pearson coefficient was $r = 0.465$, so there is a direct and reasonable correlation between the two variables. Also, $p = 0.000$ which is lower than the significance threshold, which is equal to 0.05, hence the statistical correlation is strong. At the same time, we reject hypothesis H4.0 (null) and admit hypothesis H4.1 (alternative), which shows there is a connection between

the 2 variables. The more people are concerned about their online privacy for various online activities, the more their overall concern increases, especially if there is an upward trend in online identity theft. The currently available defensive actions to address this fact, do not keep up with the rising number of stolen identities. The systems implemented by the various social platforms provide the option to verify the profiles, as well as the official status of business accounts, which helps to filter profiles that are not real or are associated with a fake identity. People are worried about this because they might be victims of actions, which are often malicious, thus putting the person's image in a negative light. Many people mix fantasy with reality. Some platforms require realistic (own) identities, others encourage the assignment of fictitious (imaginary) identities, which might make users believe this could be considered a new normal on all platforms (Moses).

Regarding the concerns expressed by people in the online environment related to the protection of personal data, interpretations are presented below. They correspond to objective 3:

- Most people (49.2%) are very concerned about online privacy.
- With an average of 3.09 we can say that people are worried, but to a small extent, that online organizations are not who they claim to be.
- An average of 3.14 implies that people are very concerned (46.9%) that too much personal information is required when registering on a website or shopping online.
- The average of 3.43 shows that they are very concerned about online identity theft (60.7% and 312 respondents respectively).
- Over 56% of respondents are very concerned that strangers may obtain personal information about you from your online activities (average 3.43).
- 53.7% (276) stated that they were very concerned that their credit card data could be captured by others.
- With an average of 3.47, respectively 63% (324) of the total respondents stated that they are very concerned that if they open a link in an email, it could be fraudulent or malicious.

The conclusions of Objective 3 were that regarding the online private data protection concerns of online consumers, we extracted the following results: people are worried that some organizations are not what they claim; Another concern is that organizations request too much personal data when creating an account on the site or purchasing a product / service, which causes users to question the collection and handling of personal data. Also, people are worried about online identity theft, but also about the fact that some unknown persons or entities can collect personal information from their online activities. A person with a fake account can find out various information about a certain profile on social media, if the data subject accepts the friend request, for example. At the

same time, phishing has become more widespread lately and more and more people have fallen into the trap of attackers, so more and more people are worried when they receive an e-mail containing a link, which is often cataloged as being malicious, especially if it comes from a company that is not very well known or that has a more unusual email address. Overall, people are concerned about the privacy of personal data in the online environment and how it can be used for malicious purposes.

5. CONCLUSIONS

A limitation of this research is the sample size and the number of responses. Given that the research tool (questionnaire) was distributed online, only those who were willing to do so filled out the questionnaire. At the same time, it is possible that some of the target people of the questionnaire were online during its distribution, which leads to the loss of some potential answers. Also, only 8 counties were studied. In this approach, a subsequent work can be carried out, covering all the counties of Romania, to find out, at country level, how e-consumers relate to the confidentiality of personal data.

Most of the answers came from the young, the category of people who are older being in a much smaller percentage, which does not fully allow the study of differences or similarities between generations. To remedy this impediment, a questionnaire can be made in physical form and distributed to people who are not very active in the online environment or who are elderly. Regarding the results obtained, it appears that people are concerned about the confidentiality of personal data in the online environment. There are also people who do not attach importance to this, which makes it easier to disclose personal information or obtain it from other malicious people, given that people do not check their computer programs or do not use security measures against online attacks.

The title of the paper is Consumer in Cyberspace - Disclosure of Personal Information, so we can look at this disclosure from two points of view. The first point of view would be that people can "disclose" their personal information to companies themselves. As the research shows, the trust that the site confers by the presence of the privacy policy, by displaying the agreement on the acceptance of cookies and what they are used for, and the fact that the organization did not have unpleasant events regarding the relationship with users, in the online environment, regarding the personal data collected and analyzed, help to provide users with as much data as possible for registration on the site or purchases.

The second view is that personal information may be "disclosed" by malicious persons. Consumers who do not pay special attention to the way they use the online environment can be victims of attacks by various existing methods, from phishing, spyware, ransomware, which encrypts the user's data, and if he does not pay for decryption, his data is completely lost. And sold on

the black market. Companies need to inspire user trust and a sense of focus on the customer and not on the sale, because the customer buys based on cognitive and emotional elements. There is a much higher chance of success for companies that are transparent about the collection and purpose of personal data, than companies that do not treat user privacy as an important element.

People are worried because a lot of personal data is collected from social media profiles, especially by strangers, who would not normally have access to that data if they did not know that person offline. Online identity theft is a concern among many users. The need to develop elements of filtering and securing the environment, by stopping fake accounts should be a key element in everyday life. People also pay a lot of attention to the online experience. The use, by companies, of pop-up windows in an abusive way leads, most of the time, to the users' desire to block them or leave the site and not return to that site. Users prefer to choose for themselves what to subscribe to or unsubscribe to, considering that pop-ups that contain various forms or that appear at important times should no longer appear.

Another concern most often expressed by people is that of the need for large amounts of personal data, the creation of an online account, or a purchase. People think that they are asked for too much data which is not necessary but helps to shape a customer's profile. Overall, people are paying attention to their personal data, but there are still people who do not fall into this category, the disclosure of personal information is much easier to do in their case.

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USER SATISFACTION WITH INFORMATION CHATBOTS IN THE BANKING SYSTEM

DRAGOȘ FLORENTIN MARICIUC

*Alexandru Ioan Cuza University of Iași
Iași, Romania
dragos.mariciuc@gmail.com*

ANDREIA GABRIELA ANDREI

*Alexandru Ioan Cuza University of Iași
Iași, Romania
andrei.andreia@gmail.com*

Abstract

For some years banks use countless applications and web pages that seek to create a conversation with an end user through an artificial intelligence that reacts by answering questions either by text or by voice, as an average person does. We are talking about the so-called Chatbots, which have been acquiring great importance due to their different and practical applications in the real world as is the case of the interaction between large companies and their customers. Since it is believed that chatbots have witnessed a kind of “renaissance” in the past few years, one could wonder how well-known chatbots are nowadays and if they are used regularly. Chatbot user experience refers to users’ general experience when using automated dialog systems. Users might feel reluctant to use chatbots or they could, on the other hand, be open-minded and even become emotionally involved with them. In many instances the interactions do not meet the expectations the users have towards chatbots. This article aims to assess user satisfaction with information chatbots so that chatbot developers in the banking system can provide a better experience for end-users.

Keywords: chatbots; artificial intelligence; technology; satisfaction; banking.

JEL Classification: M31

1. INTRODUCTION

Nowadays, the world is transforming dramatically. Businesses have to adapt to the results of the fourth industrial revolution. Online consumers are growing and rapidly changing, business environment is pushing the banking System to differentiate itself by providing better customer experience. The rapid evolution of AI has created opportunities for companies to interact with customers using chatbots (Chen, Le and Florence, 2021). Chatbots can be described as software that receives textual input from the user and based on its AI, responds with a textual output. With the increased use of instant messaging

apps, people have changed the way they prefer to connect with businesses. Today, the dominant channel is online chat where employees have been entrusted to perform communication with customers. But with the positioning of Chatbots this is starting to change. This experience is greatly favored by machine learning, this type of artificial intelligence allows the bot to learn from human behavior by itself, with this companies seek to understand their customers in a more efficient way and suggest services according to their profiles

The concept of the chatbot has been around for nearly 60 years, however, the idea of using such technology for customer service has arrived around the same time as the internet boom and the start of the digital transformation (Adam, Wessel and Benlian, 2020; Zemcik, 2019). During the past decades several aspects of life have all been digitized, from personal information to work to personal entertainment. Through this, several kinds of AI, automation and other kinds of advanced technologies are becoming ingrained in our lives (Guo, 2015). The technology we use today has and will continue to change the way information is consumed and communicated (Setia, Venkatesh and Joglekar, 2013; United Nations, 2021). Thus, it is only normal that businesses follow suit with their customer service offerings, therefore they started to offer more digital options for communications with their customers (Setia, Venkatesh and Joglekar, 2013).

Furthermore, Goyal and Singh (2021) investigate the use of automation and robot agents in terms of customer services activities. This investigation found that automation creates efficiency and leads to an improved quality of service, resulting in improved customer satisfaction, loyalty, and word of mouth. However, Grewal *et al.* (2020) argued that advanced technology has a negative impact on customer experience, resulting in substantial effects on organizations. For instance, Kemppainen and Frank (2019) demonstrated that a negative customer experience has an impact on an organization's reputation and damages the relationship with customers. Even though the potential risks of integrating AI technologies are known for businesses, there have been massive movements toward its use (Pradeep, Appel and Sthanunathan, 2019). For instance, nowadays customer service agents are being replaced by conversational software agents such as chatbots, and it has been proven that customers are experiencing it negatively (Adam, Wessel and Benlian, 2020). As a result, this could be formulating issues and influencing customers' trust since it is changing their behavior and judgments toward service providers (Adam, Wessel and Benlian, 2020; Kim, Giroux and Lee, 2021). Thus, this study is exploring customers' trust in AI technology and chatbots as this subject still provides many opportunities for further exploration and discovery, considering that the prevalence of this kind of technology will only continue to grow in the coming years (Guo, 2015; Grand View Research, 2021).

2. THEORETICAL FRAMEWORK

Artificial Intelligence (AI) is the processes and operations that a computer or robot can perform on its own (Dirican, 2015). Developments in AI and automation have been growing quickly especially throughout the past decade, and nowadays it is used in every part of every industry and is changing the way that businesses operate (as noted in the previous sections). AI and automation have already existed for several decades, but nowadays it is becoming more and more ingrained in our daily lives (Guo, 2015). Due to major developments in artificial intelligence (AI) technology as of recent, companies have been turning toward automated chatbots to complement the provided services. As discussed in the previous section, the agent turnover rates are relatively high in the call centers industry (Örmeci, Salman and Yücel, 2014). Therefore, businesses might start moving their operations towards AI to save resources that are wasted on the performance of their call centers (Adam, Wessel and Benlian, 2020). Kim, Giroux and Lee (2021) investigated consumers' trust and acceptance towards AI technology. This examination proves that businesses benefit from AI based technology due to the information it collects about its consumers behavior. In other words, businesses can obtain information about their consumer preferences to improve their marketing and communication activities (Kim, Giroux and Lee, 2021). Additionally, businesses make use of advanced technology to gain more knowledge about customers with the goal of enriching customer loyalty and sales (Tao and Rosa Yeh, 2003).

The fields of application of business chatbots are numerous. They can open doors for companies and serve them in many ways: customers can use them to make appointments, book flights and hotels, schedule payments or simply ask questions and get information about a service. Media companies like CNN and FOX designed a chatbot which gives customers personalised information and news that might fit their interests. Customers can choose a general topic and the chatbot will share the latest articles written about this particular topic. The H&M's chatbot gives advice to customers in terms of fashion and asks questions in order to look for clothes that match the user's style. It also makes outfit suggestions and asks the user to choose between combinations of clothes. A further example is the company SNCF (the French rail network company), which developed a conversational assistant ("OUI.bot") to help travellers to book and pay for their train tickets. In their paper on the use of chatbots in Public Transport, Zumstein and Hundertmark (2017) report on the distribution of business chatbots applications. Chatbots are most frequently used as calendar assistants, then as a way of purchasing event tickets, doing research while shopping online and booking transport tickets. Other fields of application include providing information about daily news and about services for customers. Finally, they are used to a lesser extent for delivery service.

Recently, there has been a massive movement towards the use of technology in business operations and processes in all areas of business (Pradeep, Appel and Sthanunathan, 2019), as well as in personal life (Przegalinska *et al.*, 2019). For example, Facebook using AI for facial recognition and Amazon's voice digital assistant, Alexa have become widely used (Przegalinska *et al.*, 2019). This kind of evolution during the digital age has been given the name digital transformation. Vial (2019, p. 118) defines digital transformation as "a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies." Digital technology has and continues to change the way individuals consume information and interact with products and services (Setia, Venkatesh and Joglekar, 2013; United Nations, 2021). This has contributed to a significant change in customer expectations which influences customer satisfaction and eventually the full customer experience (Agarwal *et al.*, 2020). Due to the shift towards technology, as well as globalization, consumer preferences have been reshaped and businesses are following suit to accommodate these changes (Pereira *et al.*, 2022).

It is confirmed that advanced technology has an impact on customer experience (Grewal *et al.*, 2020). Thus, the interaction between front-line employees (FLEs) and customers have changed due to this transformation in business practices. This transformation has created new communication channels between organizations and their customers (Scherer, Wunderlich and Von Wangenheim, 2015; Singh *et al.*, 2017; Fan *et al.*, 2020). As a result, there has been an increase in use of online services which have reduced the number of physical interactions between organizations and its customers (Yang, Jun and Peterson, 2004).

Previous research has shown that attitudes towards chatbots tend to be neutral (Van Eeuwen, 2017) or to go from neutral to "slightly positive". Shah *et al.* (2016) found that younger people (<25) had a more positive attitude regarding chatbots than other age groups, which is in all likelihood due to the fact that they grew up in a technological society and are therefore more familiar with mobile phones, social media and apps. Shah *et al.* (2016) also found that women were more favourable to chatbots than men. One potential factor explaining this difference is, according to the authors, perhaps the fact that twice as many men had already had a conversation with virtual assistants, which could lead them to have higher expectations. All these findings show that demographics such as age and gender tend to have an impact on users' attitude.

Brandtzaeg and Folstad (2017) explored the motivational factors that drive people to make use of chatbots. They can be divided into four categories: productivity, entertainment, social purposes and novelty. The majority of participants (68%) in their survey note that productivity is the main reason why

they use chatbots: fast answers, availability and ease of the task are essential. Entertainment value was ranked second (20%) because chatbots are considered to be “fun” and amusing. The third reason, social purposes, was given by 12% of the participants, who use chatbots in order to talk to “someone” when they feel lonely. The last factor is novelty: chatbots are relatively new to people, which is why some of the users (10%) try them out of curiosity.

Adam, Wessel and Benlian (2020, p. 427) discussed this argument and argued that “human chat service agents are frequently replaced by conversational software agents (CAs) such as chatbots, which are systems such as chatbots designed to communicate with human users by means of natural language.” This investigation found that customers experienced unsatisfactory service quality by CAs. For example, CAs could provide unlogical answers which fail to meet customers’ expectations. As a result, it has an effect on consumers’ trust, loyalty, and satisfaction (Adam, Wessel and Benlian, 2020; Kim, Giroux and Lee, 2021). Previous research has shown that one of the biggest assets is probably the fact that chatbots are available 24 hours a day, 7 days a week (Hundertmark and Zumstein, 2017). They are always there, at the disposal of customers and they do not need to take account for opening hours, which is convenient for people who work late and do not have time to call phone centres. If they have a particular question or request in the middle of the night or early in the morning, the chatbot is always present to give an answer.

Furthermore, customers don’t have to queue or to wait indefinitely on the phone to get an answer to their questions; chatbots are quick and can handle different requests at the same time. Long waiting times can sometimes be frustrating for customers and can make them feel like they are insignificant (Garbarino and Johnson, 2019). Valero conducted a survey (Velaro, 2012) to know how much time clients were ready to wait on the phone in customer service circumstances: 32.3% think the company should answer right away, 27.5% think it is acceptable to wait 1 min and 30.2% can wait for up to 5 minutes. Only 10% are ready to wait for more than 5 minutes, which shows how long waiting times can have a negative impact on customer satisfaction.

Customer loyalty can be achieved by increasing customer satisfaction (Brandtzaeg and Folstad, 2017). In the current era competition between companies fighting for the individual customer is bigger than ever.

Because of these developments and growing competition, companies constantly have to attract and retain customers (Maroengsit *et al.*, 2019). So, there is an urgent need for companies to have loyal customers and customer loyalty is influenced by customer satisfaction.

Jenneboer, Herrando and Constantinides (2022) discuss the impact of chatbots specifically on customer loyalty and explain that system quality, information quality and service quality are the main factors contributing to user satisfaction. These factors are also typically what is expected of regular

customer contact with humans, the difference is that with the use of technology with chatbots in some situations can result in dissatisfaction. However, Jenneboer, Herrando and Constantinides (2022, p. 213) mentioned “in this digital age where the continuous availability of businesses is crucial, optimizing the customer experience is more important than ever before.” Jenneboer, Herrando and Constantinides (2022) briefly discuss the topic of privacy with chatbot technology and mention that privacy is mainly an issue for consumers due to a lack of trust. The authors continue to explain that a human-like interaction with a chatbot aids in easing the worries about privacy and can increase customer trust (Przegalinska *et al.*, 2019; Jenneboer, Herrando and Constantinides, 2022). Jenneboer, Herrando and Constantinides (2022) explain that even creating an appearance, name, and personality for a chatbot contributes to an improved level of customer trust. Additionally, researchers also found that some individuals may trust a chatbot more than a human, due to automated information leading to decreased mistakes (Przegalinska *et al.*, 2019). Therefore, it can be argued that a chatbot can contribute to customer trust, satisfaction, and loyalty in the case that all aspects are reliable and relevant (Jenneboer, Herrando and Constantinides, 2022).

3. PROBLEM STATEMENT

Especially during the global pandemic customers had to rely mostly on online tools like chatbots, to seek for relevant information about their orders or simply to make decision about purchasing products and selecting brands for purchases. Because they had no human contact with shop assistants, the human contact was completely lost, and also a lot of people in customer service lost their jobs. (Cheng and Jiang, 2021) Little research has been done on user satisfaction, especially not in Romania.

In recent years there has been a huge trend towards self-service support for customers (Guo, 2015; Goyal and Singh, 2021). The ways in which it is helpful for businesses is quite obvious, but does it result in an improved service experience for customers? Nowadays, chatbots have become the base of many business' customer service websites to aid customers in their search for information, however, they have become notorious for being unhelpful and lacking proper understanding (Adam, Wessel and Benlian, 2020). Due to the level of automation the chatbots are built with, they are typically not sophisticated or developed enough to mimic a human conversation. Through this, customers are often left frustrated and disappointed in their chatbot experience, eventually with enough of these negative chatbot experiences customer trust becomes fully eroded and less likely to repurchase in the future (Thaichon *et al.*, 2014; Wilson *et al.*, 2016; Adam, Wessel and Benlian, 2020; Kim, Giroux and Lee, 2021).

Similar previous research has been conducted by Chen, Le and Florence (2021), however most respondents in the study are from Asia and the United States meanwhile this research focused in Romania.

Customer satisfaction is a critical part of a business and its operations. Several researchers consider it to be one of the most difficult aspects of operating a business, especially when considering all of the components that play a part in it today (Barsky and Labagh, 1992; Morgeson *et al.*, 2020). Additionally, due to all the different components, as well as (previous) customer expectations that must be considered, measuring satisfaction can prove to be quite difficult to measure and research accurately. Customer behavior shifts and chatbots are used more now, people know more about it and chatbots have definitely become better now.

Under these considerations, several research hypotheses are followed in the paper:

***H1.** The frequency to which the banks' clients interact with the chatbots is low and differs across individuals*

***H2.** The quality of conversation and of provided information is the most problematic when interacting with a chatbot*

***H3.** There are significant differences in the perceptions regarding the performances of a chatbot by categories of respondents*

4. DATA AND METHODOLOGY

To achieve the goal of the paper, an online survey was conducted among bank clients that interacted with a chatbot, resulting in a sample size of 164 eligible respondents. The questionnaire used for collecting data aimed at assessing the experience had when interacting with a chatbot, as perceived by the respondents. Several dimensions are followed when intending to evaluate these experiences, as presented in Table 1.

The dimensions and their subsequent sub-dimensions are measured by three items. The respondents are asked to evaluate statements about chatbot functions' performance in interacting with the users on Likert scales, giving a score from 1 (Strongly disagree) to 7 (Strongly agree).

Other than assessing the perceived performance of a chatbot, the frequency of interactions and perceived overall efficiency in customer support of a chatbot is evaluated, also by using a Likert scale, with scores from 1 to 7.

Table 1. Dimensions and sub-dimensions of users experience when interacting with a chatbot

Dimensions of users' experience in interacting with the chatbot	Sub-dimension
Accessibility to the chatbot's functions	Ease in conversation with the chatbot Ease in accessing the chatbot
Quality of the chatbot's functions	Clear expectation regarding the chatbot's capability Capacity of maintaining a topical discussion Quality of guiding to relevant service Quality of answers in unexpected situations Clear answers Reliable answers
Quality of conversation and information provided by the chatbot	Effort in communicating with the chatbot Acknowledging and facilitating reaching the user's goal Relevance of provided information Appropriate amount of information provided Social presence of the chatbot
Privacy and security provided by the interaction with the chatbot	Privacy and security
Speed in interacting with the chatbot	Speed

Descriptive statistics and statistical tests for verifying the significance of the mean differences between categories of respondents are used in order to obtain the empirical results that help answer the research questions.

5. EMPIRICAL RESULTS

First, an internal consistency of the questionnaire's items is employed, calculating the Cronbach's Alpha reliability coefficient for each sub-dimension evaluating the experience interacting with a chatbot. Results are presented in Table 2.

Table 2. Cronbach's alpha for each sub-dimension

Sub-dimension	Cronbach's Alpha coefficient
Ease in conversation with the chatbot	0.971
Ease in accessing the chatbot	0.955
Clear expectation regarding the chatbot's capability	0.939
Capacity of maintaining a topical discussion	0.945
Quality of guiding to relevant service	0.930
Quality of answers in unexpected situations	0.918
Clear answers	0.950
Reliable answers	0.958

Sub-dimension	Cronbach's Alpha coefficient
Effort in communicating with the chatbot	0.764
Acknowledging and facilitating reaching the user's goal	0.953
Relevance of provided information	0.962
Appropriate amount of information provided	0.929
Social presence of the chatbot	0.949
Privacy and security	0.939
Speed	0.945

The scale reliability is good and consistent across the items of each sub-dimension (the coefficient is over 0.7 and positive in all cases).

In order to analyze the interactions' frequency with a chatbot and the its efficiency in improving customer support, summary statistics (Table 3) and differences in perception across different categories of respondents (Table 4) are presented.

Table 3. Descriptive indicators for frequency of an interaction and perceived overall efficiency in customer support of a chatbot

	Mean	Median	Std. Dev.	Skewness	Kurtosis	Percentiles		
						25	50	75
Frequency of interaction with chatbots in the last 12 months	3.32	3.00	1.975	.412	-1.018	1.00	3.00	5.00
Having chatbots improved the customer support services	4.71	5.00	1.691	-.548	-.193	4.00	5.00	6.00

The frequency to which the banks' clients interact with chatbots is low, with an average score of 3.32 out of a maximum of 7, only 25% of respondents use chatbots with close to a monthly or weakly frequency.

In terms of improving the customer service when using chatbots, respondents rather agree with this statement, 25% of them are in agreement or total agreement with this statement.

Statistical test – *t* test and *F* test - are employed to assess if any significant differences in opinion are observed across different categories of respondents. Results are presented in Table 4.

Table 4. Testing results for the difference in frequency of interactions and efficiency as customer support by respondents' characteristics

	Sex	Age	Education
Frequency of interaction with chatbots in the last 12 months	0.756 (0.451)	3.239 (0.042)	1.899 (0.097)
Having chatbots improved the customer support services	3.172 (0.002)	0.649 (0.524)	0.940 (0.457)

Note: probability value in brackets

For a 10% level of significance, there are significant differences in frequency by age and level of education. When analyzing the perception that using chatbots determines in an increased performance in customer support, the results show a significant difference in perceptions only between men and women.

Regarding the dimensions when assessing the perceived performance with a chatbot, for each sub-dimension, an average score is calculated to assess the extent to which the respondents agree with the presented statements. These averages are used to calculate the dimension's average score. The descriptive indicators for each dimension and sub-dimension are presented in Table 5.

Table 5. Descriptive indicators of dimensions and corresponding sub-dimensions

	Mean	Median	Std. Dev.	Skewness	Kurtosis	Percentiles		
						25	50	75
Accessibility	4.8926	5.0000	1.72281	-.468	-.811	3.8333	5.0000	6.5000
Accessibility1	4.8405	5.0000	1.80448	-.399	-1.034	3.5833	5.0000	6.6667
Accessibility2	4.9499	5.0000	1.70442	-.543	-.638	3.6667	5.0000	6.3333
Functions quality	4.5898	4.7500	1.53931	-.436	-.535	3.7917	4.7500	5.8750
Functions quality1	4.6953	4.6667	1.67135	-.307	-.899	3.3333	4.6667	6.0000
Functions quality2	4.5194	4.6667	1.60112	-.318	-.641	3.3333	4.6667	5.6667
Functions quality3	4.5945	4.6667	1.66084	-.362	-.762	3.4167	4.6667	6.0000
Functions quality4	4.4400	4.3333	1.62136	-.305	-.761	3.0833	4.3333	5.9167
Functions quality5	4.6189	4.6667	1.67866	-.360	-.769	3.6667	4.6667	6.0000
Functions quality6	4.6494	4.6667	1.70124	-.366	-.816	3.4167	4.6667	6.0000
Conversation quality	4.5475	4.7333	1.47042	-.491	-.430	3.6167	4.7333	5.6000
Conversation quality1	4.2127	4.0000	1.51799	-.062	-.659	3.0000	4.0000	5.3333
Conversation quality2	4.7124	5.0000	1.71408	-.472	-.754	3.6667	5.0000	6.0000
Conversation quality3	4.7378	5.0000	1.69838	-.393	-.833	3.3333	5.0000	6.0000
Conversation quality4	4.6392	5.0000	1.62884	-.417	-.622	3.6667	5.0000	6.0000
Conversation quality5	4.4207	4.3333	1.71081	-.198	-.902	3.0000	4.3333	5.9167
Privacy&security	4.6768	5.0000	1.74027	-.444	-.866	3.3333	5.0000	6.0000
Speed	4.8455	5.0000	1.69380	-.444	-.795	3.6667	5.0000	6.3333

In general, the scores given by the clients in evaluating the functions of a chatbot when interacting with it are not in the high spectrum, but rather in the medium high. The highest averages are recorded for chatbot functions such as accessibility and speed in responses, and the lowest scores in appreciating the interaction with the chatbot are given for the quality of the conversation, specifically for the effort perceived by the user when engaging and sustaining the communication with the chatbot, there results confirming the second research hypothesis of the study.

Table 6. Testing results for the difference in perceptions of the chatbots performance by respondents' characteristics

	Sex	Age	Education
Accesibility	1.234 (0.219)	0.981 (0.377)	1.141 (0.341)
Accesibility1	1.158 (0.249)	0.890 (0.413)	1.447 (0.211)
Accesibility2	1.293 (0.198)	1.033 (0.358)	0.933 (0.461)
Functions_quality	1.264 (0.208)	1.294 (0.277)	1.484 (0.198)
Functions_quality1	1.404 (0.162)	0.839 (0.434)	1.299 (0.267)
Functions_quality2	0.497 (0.620)	1.071 (0.345)	2.307 (0.047)
Functions_quality3	0.798 (0.426)	0.465 (0.629)	1.429 (0.217)
Functions_quality4	0.805 (0.422)	1.918 (0.150)	0.835 (0.527)
Functions_quality5	1.857 (0.065)	1.763 (0.175)	1.046 (0.393)
Functions_quality6	1.925 (0.056)	1.419 (0.245)	1.432 (0.216)
Conversation_quality	0.986 (0.326)	1.412 (0.247)	1.486 (0.197)
Conversation_quality1	0.467 (0.641)	0.272 (0.762)	2.059 (0.073)
Conversation_quality2	1.561 (0.120)	1.260 (0.286)	1.181 (0.321)
Conversation_quality3	1.329 (0.186)	2.574 (0.079)	1.105 (0.360)
Conversation_quality4	0.690 (0.491)	1.319 (0.270)	0.853 (0.514)

	Sex	Age	Education
Conversation_quality5	0.469 (0.639)	1.753 (0.177)	0.993 (0.424)
Privacy&security	1.425 (0.156)	0.606 (0.547)	0.752 (0.585)
Speed	2.021 (0.045)	3.384 (0.036)	0.808 (0.545)

Note: probability value in brackets

When analyzing the differences in perceptions across categories of respondents, three characteristics are considered: the sex, age, and level of education of the respondent. With very few exceptions, the perceptions regarding the performance of a chatbot in delivering assistance and communicating with the user do not differ across categories of individuals. At dimension-level, the only difference is found for the perception regarding the speed of interaction with the chatbot, between men and women and between different age categories of the respondents. Considering these findings, the third research hypothesis is not confirmed by the results of the study.

6. CONCLUSIONS

In conclusion, these empirical findings confirm the gap found in the literature. The first gap that was discovered was regarding the frequency to which the banks' clients interact with chatbots. The majority of respondents felt that the current state of chatbots today was not satisfactory therefore they were lacking trust in the systems.

The perceptions regarding the performance of a chatbot in delivering assistance and communicating with the user do not differ across categories of individuals. Most respondents reported feelings of disappointment and irritation when chatbots and other technology does not work as expected or designed. Therefore, most respondents illustrated low expectations for future chatbot experiences.

Businesses continue to increase their reliance on such digital solutions for customer services and technical support even though they often fail in providing a satisfactory service. As a result, businesses experience customers that are disappointed and dissatisfied with the aid or service that is offered through the digital channels. The empirical findings illustrated the respondents did not necessarily feel that a service failure should result in avoiding the company for the possibility of a repeat purchase. Only a few respondents felt that this should be the case; the majority of individuals felt that they would give the company a second chance. Therefore, businesses should make improvements in their digital service offering to improve customer experience and perception.

It is recommended that organizations should ensure that their customer is realizing that the provided service is secured. In other words, service failure can occur in any service offering. However, it is essential to minimize the impact on customer satisfaction to retain loyal customers. The respondents in this investigation expressed that chatbots are only useful for simple questions and do not expect to receive support from them. As a result, it is not recommended that businesses rely entirely on self-service technologies such as chatbots. As a result, these recommendations outline the importance for businesses to invest more resources in the development of such self-service technologies. Customers do appreciate the possibilities to use this technology. However, they often feel that it is simply not smart enough to understand the nuances that might be present in certain questions or requests. However, the empirical findings confirm that chatbots must experience major development and improvement to ensure a growth in use moving towards the future.

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THE IMPACT OF NON-FINANCIAL PERFORMANCE FACTORS ON THE VALUE OF THE COMPANY

CAMELIA CĂTĂLINA MIHALCIUC

*Stefan cel Mare University of Suceava
Suceava, Romania
camelia.mihalciuc@usm.ro*

MARIA GROSU

*Alexandru Ioan Cuza University of Iași
Iași, Romania
maria.grosu@uaic.ro*

Abstract

Performance is one of the main indicators that explain the level of development of a company. Also, performance is one of the most important variables and will always remain a fairly discussed and constantly evolving topic. Performance has evolved towards a global approach that includes certain financial and non-financial factors with an impact on the value of a company that refers to elements of social responsibility. Non-financial indicators are considered to be more forward-looking, better able to predict future performance, more suitable for measuring intangible assets and less likely to be manipulated than financial values. The performance measurement system, including non-financial indicators, provides a more comprehensive picture of performance factors as it measures areas of performance beyond financial results. When we refer to non-financial performance, it refers to the result of a company's efforts in terms of customer satisfaction and loyalty, working conditions and employee satisfaction /retention, product /service quality, overall company quality, market share, productivity and innovation, as well as environmental and social issues. Thus, a company that is sustainable will have to focus on those sustainable business practices based on the above mentioned aspects, which will contribute to the creation of long-term value, value of the company brought by social, environmental and economic factors. The proposed objective of this paper was to highlight the importance of non-financial performance factors in the sustainable value creation system of companies and their analysis based on a representative sample of companies in the financial industry listed on the BSE, an investigation of the situation of the companies in this field of activity involved in the objectives of sustainable development is also carried out.

Keywords: *company value; value creation system; sustainability; sustainable company; non-financial factors.*

JEL Classification: M14, M48, O13, Q01

1. INTRODUCTION

Indicating the level of development of an organization, through performance, shows that performance is one of the most important variables within organizations. A global approach to performance includes both financial and non-financial factors, the latter being developed through the sustainable business practices of organizations that also include corporate social responsibility actions with an impact on the value of organizations (Mihalciuc, Grosu and Apetri, 2020). When creating their strategies, organizations must pay attention to the objectives that will implement them, ensuring a certain balance between improving the image of the organization, gaining a competitive advantage or forming a sustainable environment (Gănescu, 2012).

Thanks to the CSR actions implemented continuously, we can appreciate the fact that the banking sector can adapt to the trends of environmental protection and involvement in social actions, thus contributing to sustainable development in this financial sector and highlighting the link between the two pillars, environment and CSR actions (Frecea, 2016).

Corporate social responsibility (CSR) or business social responsibility as a concept became known with the impact that globalization had on the economy, playing an important role in the economic system (Mihalciuc and Apetri, 2019). Organizations should be socially responsible not only to maximize their profits, but also in order to contribute to the well-being of society in general and also to protect the environment (Mihalciuc and Apetri, 2017). The purpose of CSR is to “minimize compromise and maximize synergies” resulting from the organizational links with the economic, community and natural environment in which it operates (Iberdrola, 2021).

Social responsibility is a commitment made by organizations to contribute to sustainable economic development, together with employees, families, local communities and society as a whole, to improve their quality of life, through methods suitable for both business and development (Albu *et al.*, 2013).

A concept related to CSR in the banking system is represented by Green Banking, this notion being used for the first time at the launch of the first Green Bank, in 2009, in the United States (Hebbar, 2020). A successful leader in the sustainable banking sector is still considered Triodos Bank (2021). There is no standard definition for this concept, but there are sufficient explanations in the literature (Kern, 2016). Thus, ideas are found that are correlated with the following aspects: "environmental, social and governance (ESG)"; "Sustainable banking"; "Corporate Social Responsibility (CSR)" (Barua, 2020). We can thus say that this concept can be defined as “a type of bank that offers sustainable financial services” (Eco Mastery Project, 2021).

Starting from the Objectives of the 2030 Agenda, the main purpose of this paper is to analyze the sustainability reports of companies in the financial sector listed on the BSE, highlighting the importance of social responsibility projects

for these companies. We set out to perform such an analysis in this direction, due to the fact that the effects of the COVID19 pandemic have largely influenced some of the changes that banks have had during the period of preventing the spread of the virus. When in a company the resources required to carry out the activity are limited and present a competitive pressure, the organization's management should consider assuming perseverance and commitment in times of crisis.

2. LITERATURE REVIEW

The specialized literature attempts in many ways to highlight the importance of non –financial factors in assessing the global performance of the organization. Thus, the authors of the paper considered it appropriate to make a brief analysis of the importance of non-financial factors in ensuring global performance of an organization.

Several authors launched various hypotheses on information and non-financial indicators on the importance of an organization and assigned several definitions, as can be seen in Table 1.

Table 1. Review of the literature on the impact of non-financial factors on performance

Nr. crt.	Authors	Highlights of the importance of non-financial information and non-financial indicators on the performance of the organization
1.	Banker, Potter Srinivasan (2000)	In evaluating non-financial performance, measures such as customer satisfaction, employee satisfaction, productivity, product quality and market share in managers' compensation were considered.
2.	Kaplan and Norton (2001)	The authors have shown that financial measures, although important, are not sufficient to ensure an efficient performance appraisal system, which should also include non-financial performance measures, reflecting key business creation activities value.
3.	Cohen, Krishnamoorthy and Wright (2008)	Non-financial information includes "general economic conditions, technological changes in the customer's vision and new products from competitors".
4.	Callen, Gavius and Segal (2010)	Non-financial information is relevant in explaining annual returns, stock prices and investment grading by investors (long-term) and "non-financial variables are relevant to value after controlling for financial variables which suggests that the two types of variables are complementary.

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5.	Soudani (2012)	Includes indicators of non-financial performance, such as, for example, improving customer service, employee stability, customer, and social responsibility practices / activities.
6.	Attiea, Mohamed and Amjad (2014)	Many firms now supplement summary financial measures with non-financial aspects that reflect key value-creating activities.
7.	Barker and Eccles (2018)	Users are interested in non-financial information because they face challenges in accessing information that is considered relevant, reliable, complete, and comparable. The use of this type of information can contribute to a correct evaluation of organizations and determine the success in decision making
8.	Tarquinio and Posadas (2019)	Investigate how the term "non-financial information" is defined in the literature and concluded that the meaning of non-financial information is still ambiguous and multifaceted, without a common understanding, no single definition and no generally accepted term.
9.	Laskin (2020)	Non-financial indicators can fill the existing gap in the information needed to make decisions. The use of this type of information can contribute to a correct evaluation of the organization.
10.	Gal and Akisik (2020)	found that although the information in the financial reports is relevant for measuring the performance of the organization, shareholders consider relevant and non-financial information to be able to determine the value of organizations.
11.	Barbosa, Monteiro and Pereira (2021)	The authors associated non-financial factors with that information related to social responsibility and sustainability, specifying that non-financial information covers a wide range of issues and issues related to policies and environmental and social impact, which relate to: resource and energy use, greenhouse gas emissions, pollution, biodiversity, climate change, waste treatment, employee health and safety, gender equality, education, and is essential because it improves accountability and transparency to stakeholders
12.	Monteiro <i>et al.</i> (2022)	The study develops and evaluates a model that shows the importance of the quality of non-financial information and its impact on non-financial performance. Research is important for company managers, because it provides a better understanding of the factors that contribute positively to the success of decision-making and the non-financial performance of companies.

Source: own elaboration based on information taken from specialized articles

Starting from the importance of non-financial factors on the performance of an organization, aspect presented in table 1, we also aimed to perform an analysis of non-financial factors that lead to the formation of an adequate performance management system.

A description of the importance of non-financial factors in the performance measurement system based on the analysis of studies in certain fields of activity can be found suggestively in Table 2.

Table 1. Analysis of specialized studies on non-financial factors implemented in certain areas

Domain	Authors	Research results	Conclusion
Hotel	Mak and Chang (2019)	They highlighted some environmental strategies: the adoption by the government of the appropriate legislation in the field; raising the awareness of hotel management and environmental owners.	According to the study, the hotel industry focuses on both customers and employees,
	Mjongwana and Kamala (2018)	Highlights the main non-financial performance indicators: bed occupancy levels; customer satisfaction; number of complaints and guest rating; customer evaluations on employee usefulness; number of repeat customers;	Because they are the engines of value in the hotel industry, bringing future performance to the industry.
Energy	Milojevic <i>et al.</i> (2020)	The study considers non-financial indicators based on materials received from five energy companies in five major countries: Gazprom (Russian Federation): has been involved in environmental projects, in meeting the needs of employees; E.ON (Germany): managed renewable energy activities prior to sale; Pioneer Natural Resources (PNR) (USA): supports a diverse workforce, also employing people with disabilities; JTXG (Japan): invests in the organization and employees; pays the costs associated with self-study in the	The authors reflect the involvement of organizations in various projects to protect the environment, support employees and their continuous development.

Domain	Authors	Research results	Conclusion
Production	Abdel-Maksoud, Dugdale and Luther (2005)	energy field for employees; Customer satisfaction, employee efficiency and quality levels were considered important by all production organizations. The main non-financial measures in the field of production: product quality; customer satisfaction; on-time delivery; employee morale; product efficiency, use and development;	The production environment is characterized by an increased responsibility of employees along with the measurement and reporting of many aspects of performance.
	Smith (2019)	The success of an organization could be achieved through the gain and loyalty of customers;	
Banking	Sadek <i>et al.</i> (2012)	Non-financial measures such as sustainability, learning, growth and internal process improvement are cutting-edge measures of the management system that provide information on future performance.	Customer satisfaction is the most important non-financial measure in banking.

Source: own elaboration based on information taken from specialized articles

In the authors' view, the performance measurement and management system includes objectives related to non-financial factors, such as: attracting and retaining employees and customers, involvement in environmental projects, and taking these objectives into account in the same way as financial information, in all the four fields of activity investigated. Non-financial information, if quality, leads business managers to make successful decisions.

3. SDG REPORTING AND THE BANKING SECTOR

The way in which a company chooses to highlight its costs in accounting is correlated with the level of performance achieved from the point of view of organizational management, which implicitly affects the performance of the company in general. Usually, the way of recognizing costs in accounting gives the board of managers of a company the opportunity to check a series of clues or indications on how to set prices, manage stocks, achieve future budgets, and even identify and develop organizational objectives.

Corporate reporting develops during the transformation of the economic paradigm under the influence of the concept of social responsibility, a concept that underlies the shift from financial reporting to non-financial reporting, thus

building new indicators to assess the performance of economic entities (Beretta *et al.*, 2022). In various specialized papers, the scientific approach has shown how the concept of social responsibility affects the evolution of corporate and non-financial reporting, leading to increased awareness of methodological and theoretical approaches to corporate reporting (Gădău, 2016).

The evolution of non-financial reporting has been progressive, from social and environmental reporting to sustainable development reports, subsequently taking the form of integrated reports. Any non-financial reporting is a natural result of the development of financial reporting, its training rules were determined by the same development of principles that were subsequently used for the national design of CSR models (Bychkova *et al.*, 2021).

The sustainable development of the company consists in satisfying the various internal and external stakeholders and in particular, the analysis of the combined effect on the planet, people and economies. Therefore, the Global Alliance for the Bank of Securities (GABV) formulates a sustainable bank with the provision of services and products that meet the needs of the economy and people (Korzeb and Samaniego-Medina, 2019). Financial institutions have recently identified sustainability as a significant part of their projects, showing that sustainable banking can be a strong response to financial crises. The answer to this challenge in the banking sector may be to move from the traditional takeover of deposits and lending to investment based on commission income and commission services, such as trading, insurance and asset management (Karkowska, 2020).

The integration of the SDGs in the reporting part favors the identification of companies inspired by sustainable behaviors, and the disclosure of the SDGs in a real orientation towards sustainable principles is an action that led to a new frontier of Greenwashing called "SDG-Washing". The current scenario is characterized by the lack of studies on SDG reporting practices. Many studies have shown interest in developing compound indicators used to assess the overall quality of SDG reporting practices, with the authors pointing out that some areas, such as the banking sector, are still being adequately explored (Korzeb and Samaniego-Medina, 2019).

Avrampou *et al.* (2019), analyzes a limited number of European banks to assess their overall degree of contribution to the SDGs, this contribution of European banks to the SDGs is detected by the score obtained. Thus, the most significant contribution, in terms of SDGs, is made by a listed commercial bank in France. The level of the score obtained is because, in addition to reporting on all 17 objectives, the bank publishes a detailed non-financial disclosure in three sections of its report and in the general interest of seven types of stakeholders (Avrampou *et al.*, 2019). A minimum score is allocated to a German cooperative bank and to two English banks (an investment bank and a private bank). This can be justified by the fact that low-scoring banks are unlisted companies that

communicate general information and consider 1 or 2 SDGs in only one section of their reports. The number of stakeholders is also quite limited and varies from 2 to 4 types (Cosma *et al.*, 2019).

4. ANALYSIS OF THE SUSTAINABILITY REPORTS OF THE COMPANIES IN THE FINANCIAL FIELD LISTED ON BVB

When in a company the resources necessary to carry out the activity are limited and present a competitive pressure, the management of the entity would consider assuming perseverance and commitment in times of crisis. Thus, in this part of the work, an analysis of non-financial factors in crisis situations would be relevant to carry out, for financial entities listed on the BVB and which draw up sustainability reports. The objectives of the paper aim, on the one hand, at the comparative analysis of the evolution of the number of employees for companies in the financial sector listed on the BVB, and on the other hand at the analysis of the sustainability objectives found in the Sustainability Reports of these companies, which agree with the objectives of the 2030 Agenda, for a five-year analysis period, namely 2017-2021. Through this study, the authors want to present an overview of the financial companies listed on the BVB that report on sustainable development and the social responsibility projects in which they are involved, by achieving the number of sustainability objectives found in Agenda 2030. The companies chosen to achieve the proposed objectives are presented in Table 3.

Table 3. Companies from the financial field subject to analysis

No. crt.	Company name	The main office	CAEN code
1.	GROUPE SOCIETE GENERALE S.A. (BRD)	Bucharest	6419
2.	SSIF BRK FINANCIAL GROUP S.A.	Cluj-Napoca	6419
3.	PATRIA BANK S.A.	Bucharest	6419
4.	TRANSILVANIA INSURANCE BROKER S.A.	Bistrița Năsăud	7022
5.	TRANSILVANIA BANK S.A.	Cluj-Napoca	6419
6.	RAIFFEISEN BANK S.A.	Bucharest	6419

Source: own elaboration based on information taken from BVB

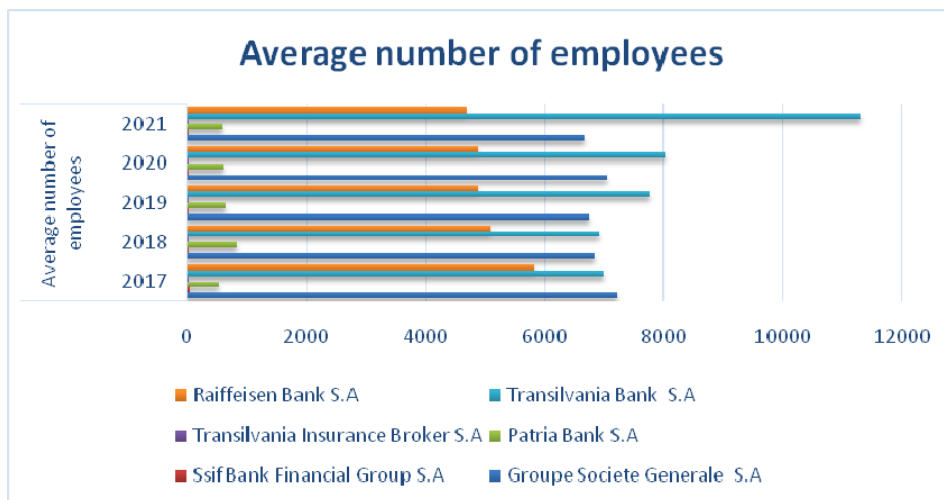
Starting from the sustainability reports of the companies in the financial field, which are listed on the BVB, with CAEN code 6419 (Other monetary intermediation activities) and 7022 (Consulting activities for business and management) presented in Table 3, we will carry out an analysis regarding the average number of employees and the number of objectives they reached during the period 2017-2021. The evolution of the average number of employees for the 6 companies under analysis, the analysis period is 5 years (2017-2021) is presented in Table 4.

Table 4. No. middle of employees for the companies subject to analysis

No.crt	Companies	No. middle of employees				
		2017	2018	2019	2020	2021
1.	Groupe Societe Generale S.A.	7205	6854	6753	7063	6675
2.	Ssif Brk Financial group S.A.	53	36	40	39	41
3.	Patria Bank S.A.	545	840	651	612	600
4.	Transilvania Insurance Broker S.A.	31	28	33	33	42
5.	Transilvania Bank S.A.	7007	6923	7772	8029	11314
6.	Raiffeisen Bank S.A.	5835	5100	4889	4894	4691

Source: own elaboration based on information taken from the Sustainability Reports of the analyzed companies

From Table 4 it can be seen that during the period affected by the COVID 19 pandemic and after the pandemic, the number of employees increased significantly at Transilvania Bank SA, followed by Groupe Societe Generale SA, but to a lesser extent and at the other companies it can be observed a slight decrease in the number of employees. Based on Table 4, Figure 1 which represents the evolution of the average number of employees for each of the 6 companies listed on the BSE, related to the period 2017-2021.

Figure 1. Comparative analysis of the number of employees for the 6 companies

Source: own elaboration based on information taken from the Table 4

From Figure 1 it is observed that sustainability reporting is obvious and brings significant benefits to companies when they consist of a larger number of employees, these reports helping companies to be transparent in the relationship with stakeholders by communicating the impact, whether positive or negative. Through sustainable reporting, a company can measure and communicate the progress of the business in managing sustainability issues with the help of employees.

Sustainable Development objectives in the financial-banking system play an extremely important role in the mobilization of financial resources to contribute to the construction and sustainable development of the Romanian society. Due to the nature of the activity of the banking companies, they are committed to support and contribute to the implementation of the 17 Sustainable Development Goals (SDGs) launched by the United Nations Organization and entered into force on January 1, 2016.

As for the non-financial sustainability report, it also aims to highlight the diversity policy that exists at the level of the administrative and supervisory departments, from which aspects related to age, gender, the professional experience acquired, the objectives must emerge environmental policies and how they are implemented (CSR Agency, 2022). Starting from the role and importance of non-financial reports, table 5 presents the main objectives that were introduced by the 6 companies from the financial field, listed on the BVB, objectives that can be found in the published sustainability reports of these companies.

Table 5. Community engagement strategy regarding social responsibility

Year	Goals in Innovation	Social/Community	Envim Goals	Staff Goals	Educat. Goals	Sport Goals	Health Goals	Culture Goals	Total
BRD									
2017	0	1	1	1	1	1	0	1	6
2018	1	1	1	1	1	1	0	1	7
2019	1	1	1	1	1	1	0	1	7
2020	1	1	1	1	1	1	1	1	8
2021	1	1	1	1	1	1	1	1	8
Ssif Bank Financial Group									
2017	0	1	1	0	1	0	0	0	3
2018	0	0	1	1	1	1	0	0	4
2019	1	0	0	0	1	1	0	0	3
2020	1	0	0	0	1	1	1	1	5
2021	1	0	0	1	1	1	1	1	6
Patria Bank									
2017	0	1	1	1	1	0	0	0	4
2018	1	1	1	1	1	0	0	1	6
2019	1	1	1	1	1	0	0	1	6
2020	1	1	0	0	1	1	0	1	5
2021	1	1	1	0	1	1	1	0	6
Transilvania Insurance Broker									
2017	0	1	0	1	1	1	0	0	4
2018	0	1	0	1	1	1	0	0	4
2019	1	1	1	1	1	1	0	1	7
2020	1	1	1	1	1	1	0	1	7
2021	1	0	1	1	1	1	1	0	5
Transilvania Bank									
2017	0	1	1	1	1	1	1	1	7
2018	0	1	1	1	1	1	1	1	7
2019	1	1	1	1	1	1	0	1	7
2020	1	1	1	1	1	1	1	1	8
2021	1	1	1	1	1	1	1	1	8
Raiffein Bank									
2017	1	1	1	1	1	1	1	1	8
2018	1	0	1	1	1	1	1	1	7
2019	1	1	1	1	1	1	1	1	8
2020	1	1	1	1	1	1	1	1	8

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Year	Goals in Innovation	Social/Community	Envim Goals	Staff Goals	Educat. Goals	Sport Goals	Health Goals	Culture Goals	Total
2021	1	1	1	1	1	1	1	1	8

Source: own elaboration based on information taken from the Sustainability Reports of the analyzed companies

As we can see from the centralized information in Table 5, the sustainability objectives that each of the 6 companies had in mind are implemented in different actions of the sustainability aspects. Thus, this presentation helps us understand the various social responsibility projects that have been undertaken, ensuring their sustainable development.

The centralizing situation by total number of objects of sustainable development, which the analyzed companies use to implement a sustainable strategy, are presented in Table 6.

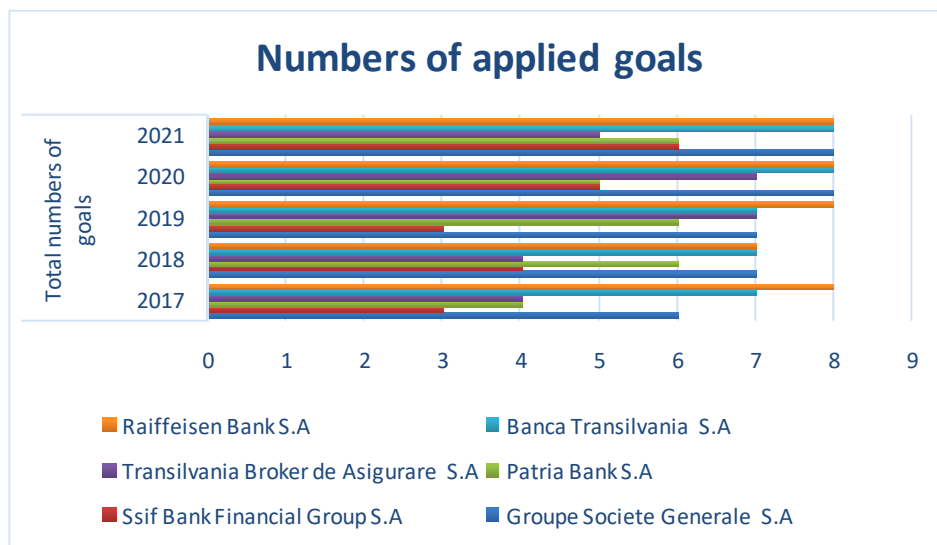
Table 6. Total number of goals implemented by companies

Companies	Total number of goals				
	2017	2018	2019	2020	2021
<i>Groupe Societe Generale S.A.</i>	6	7	7	8	8
<i>Ssif Bank Financial Group S.A.</i>	3	4	3	5	6
<i>Patria Bank S.A.</i>	4	6	6	5	6
<i>Transilvania Insurance Broker S.A.</i>	4	4	7	7	5
<i>Transilvania Bank S.A.</i>	7	7	7	8	8
<i>Raiffeisen Bank S.A.</i>	8	7	8	8	8

Source: Own elaboration based on information taken from the Table 5

Table 6 shows the total number of objectives that BSE-listed companies in the financial field present in their sustainability reports in the period 2017-2021, and in Figure 2 this aspect can be graphically observed.

As can be seen from Figure 2 during the analyzed period 2017-2021, the company that registered the highest number of implemented objectives is Raiffeisen Bank, a company that puts sustainability on the front line, and the company that presented the lowest number of objectives during 2017-2021 is Ssif Bank Financial Group S.A. These objectives helped to create certain programs and projects that were successfully implemented by each company, which had as its main goal the trajectory towards sustainability.

Figure 2. Total number of goals for the 6 companies

Source: own elaboration based on information taken from Table 6

The companies' contribution to a sustainable future must represent the impact that the objectives have on the company, and this goal can only be successfully met if the companies become sustainable from several points of view. For such a challenge, more and more companies from different fields of activity must integrate themselves into the sustainability process, through the strategies they also have in their operations, but this cannot be achieved easily (Danciu, 2013).

5. CONCLUSIONS

The performance of socially responsible companies is achieved by implementing social responsibility projects, by achieving the objectives of sustainable development according to the 2030 Agenda, found in each sustainability report. Regarding the performance of companies in the financial field for companies listed on the BVB, we can appreciate the fact that the research of sustainability objectives is a study to examine the links that occur between certain aspects of non-financial reports in order to highlight success.

From the study we carried out, we can see that all 6 companies publish a sustainability report every year, through which they present different non-financial aspects, new details regarding a company that should become more sustainable. We can thus consider that the number of employees in a company is the essential factor, being the pillar that helps the company to develop sustainably. All 6 analyzed companies have achieved every year, from the period

under analysis, several objectives related to different projects and programs and social responsibility actions.

In the top of the companies analyzed from the point of view of sustainable development objectives is the company Raiffeisen Bank S.A. which had a high efficiency for sustainable development objectives implemented in almost all the years of analysis, 2017, 2019, 2020 and 2021, totaling 8 objectives, and in 2018 only 7 objectives were reported. The BRD company also registered an important number of objectives achieved in the years 2020 and 2021, namely 8 objectives, and in the years 2018 and 2019 registering only 7 objectives. The other companies, Ssif Bank Financial Group S.A, Patria Bank S.A, Transilvania Insurance Broker, Transilvania Bank, reported the highest number of objectives between 5 and 7 in 2021, and in previous years the low number of objectives between 4 or 5 objectives.

Based on what has been presented, we can say that the six companies are socially responsible, having the opportunity to develop progressively on the territory of our country and at the level of international countries, thanks to the projects and programs they implement.

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THE ANALYSIS OF MOBILE USERS' AWARENESS REGARDING THE GDPR MEASURES DURING COVID-19 PANDEMIC

ADRIAN MUNTEANU

*Alexandru Ioan Cuza University of Iași
Iași, Romania
adrian.munteanu@feaa.uaic.ro*

VASILE-DANIEL PĂVĂLOAIA

*Alexandru Ioan Cuza University of Iași
Iași, Romania
danpav@uaic.ro*

DOINA FOTACHE

*Alexandru Ioan Cuza University of Iași
Iași, Romania
doina.fotache@feaa.uaic.ro*

Abstract

The current article is part of a larger study that investigates the behavior and awareness of GDPR rules by users of mobile devices. For this purpose, in the study, the components of the Protection-Motivation Theory (PMT) on the profile of mobile device users in Romania were analyzed comparatively (during the pre-Covid-19 period versus the Covid-19 pandemic). The study aimed at analyzing whether the perception of respondents is different depending on certain variables (such as gender, age, level of education and IT profile) in time and to investigate the perception that regular users of mobile devices have regarding information security threats. The responses were collected through an online questionnaire (N=1010), over a period of five years, respectively 2017-2019 (pre-Covid-19) and 2020-2021 (Covid-19) period. The results reveal differences between the behavior and awareness of mobile device users, depending on several variables according to the PMT model.

Keywords: *GDPR awareness; mobile users' behaviour; GDPR threats in pre-Covid-19 and Covid-19 period; protection motivation theory.*

JEL Classification: M15

1. INTRODUCTION

In the context of the Covid-19 pandemic, there was an exponential increase in the use of mobile devices to carry out human activity. This situation has led to accessing a wide range of online services (educational, entertainment, public

services, etc.). In this context, more than ever, the issue of information security threats that is affecting the mobile users has been raised. At the same time, however, there is an imbalance between the way threats are perceived and the level of users' training.

The present paper is a part of a broader study that intends to replicate the PMT when using mobile devices by end users in the context of GDPR (General Data Protection Regulation) and Covid-19 based on Furnell's conclusions. Furnell and Thomson (Furnell and Thomson, 2009) are arguing that individual perception of information security influences the risk awareness and threats. The current paper displays the study results in the context of Covid-19 pandemic (pre and during Covid-19).

Consequently, the research comprises the responses of more than 1000 users of mobile devices within the period 2017-2021. We also analysed whether the perception of respondents is different depending on certain variables (such as gender, age, level of education and IT profile) in time, to verify previous research (McGill and Thompson, 2018), and to investigate the perception that regular users of mobile devices have regarding information security threats. Due to the limitations of space, in the current paper a synthesis of our research is included. The extended version, that will also comprise the feedback (comments and suggestions) obtained from the Conference participants, will be published later.

2. STATE OF THE ART IN LITERATURE

The current study focuses on the concept of perceiving the security of mobile devices in the case of mobile users and analyzes how the perception of threats and fear affects the mechanisms / tools for protecting mobile devices.

Firstly, to obtain the list of most representative papers, in Open Knowledge Maps were used the keywords "protection motivation theory" and Covid-19. The list displayed 44 representative papers. Secondly, the above list was analyzed and the papers that did not fit with the scope of the study were removed. Thirdly, the remaining list of papers was read, and the literature review was built

2.1. The PMT model

The analysis of the selected papers shows that very few studies approached the variables of the PMT model and Covid-19. Regarding the PMT model (Burns *et al.*, 2017) define psychological capital (PsyCap) as abilities and resources that incorporate work-related motivational resources. The study analyzes the relationship between PsyCap and PMT without introducing and testing new hypotheses in the PMT model. Posey *et al.* (2014) analyze the mentality of employees regarding the organization's efforts to ensure information security and compares it against the mentality of information security

professionals. The study concludes that ordinary employees have a behavior influenced by society.

In the research performed in 2018, ENISA (European Network Information Security Agency) reviewed, among others, 30 articles studying PMT. The ENISA 2018 study concludes that there is more evidence that improving the assessment of coping, especially both self-efficacy and response effectiveness, improves user behavior and intentions (ENISA, 2018).

2.2. PMT under Covid-19 impact

The worldwide emergence of Covid-19 as a global pandemic has had the effect of increasing the use of mobile devices. For instance, some authors (Ribeiro-Navarrete, Saura and Palacios-Marqués, 2021) identified 13 technologies through which information was collected from mobile devices to track the situation of Covid-19 or to answer questionnaires for the purpose of pandemic research. In the situation of tracking Covid-19 data, Smidt and Jokonya (2021) analyze the risks of security and confidentiality of personal data as well as the ways of governing these risks. There was a general consent that mobile technology provides valuable and invaluable support to governments and health agencies in their efforts to spread the Covid-19 virus, but government surveillance has raised privacy concerns.

Wirth *et al.* (2020) analyze the balance between privacy and pandemic control. Among the dimensions discovered, the most interesting correlations are between existing applications on smartphones, the technology used to collect spatial data, existing diseases, and data protection measures.

Farooq, Laato and Islam (2020) are using the PMT as a framework and the study proposes a model outlining the effects of cyberchondria and information overload on individuals' perceptions and motivations. Alsaad and Al-Okaily, (2020) and Sommestad, Karlzén and Hallberg (2015) developed a context-driven model of the key characteristics of pandemics from the perspective of protection motivation theory (PMT).

The approach in our study is different from the research identified in the literature as it analyses the perception of mobile users' awareness toward the PMT components in the period before and during the Covid-19 pandemic.

3. RESEARCH METHODOLOGY

Research has shown that protective behaviour depends on people's privacy concerns and attitudes, knowledge, skills, experience, education, gender, and age. The aim of our research is to test the validity of PMT for end users of mobile devices during and before the Covid-19 pandemic.

The study is based on quantitative research using an on-line questionnaire which measured the variables included in the PMT model. The questionnaire was delivered online to a target audience (students and graduates of the Faculty

of Economics and Business Administration, from Alexandru Ioan Cuza University of Iași, Romania). The questionnaire distribution collected a total of 1007 valid responses.

One of the study's objectives was testing the main hypotheses (H1) and the secondary ones, SH11 and SH12, respectively:

H1: In the pre-GDRP period and during the GDPR Period, there were differences in the perception of mobile application users regarding the six threats, according to the PMT

SH11: with regards to the respondents' perception, based on Gender, Age, Education and IT profile

SH12: at the level of the entire population.

Aiming to test the hypotheses, the SPSS version 25 platform was used and a series of non-parametric Chi-square, Wilcoxon, Mann-Whitney tests were applied to the data.

3.1. Data collection and instrument design

The projected questionnaire includes 23 questions that were answered in the range:

- April 2017, a pre-GDPR period;
- October 2018 - December 2021, which is a GDPR period.

The questionnaire used was divided into two sections

- The first section measures the educational and demographic background of the respondents, the type of mobile OS and the categories of applications used (8 questions);
- The second section contains the questions that measure the constituent elements of the PMT model (15 questions).

To generalize the conclusions of the study, the target group is represented by faculty students, users of mobile devices with different levels of education (undergraduate, master's or doctoral studies) and knowledge about information security and personal data protection.

The questions in the questionnaire were tested for the degree of internal consistency, and the result of the Cronbach Alpha test is 0.918 showing strong reliability for the answers provided in the 5 value Likert scale questions.

The statistical tool included 15 questions composed based on the PMT variables according to the model (Rogers, 1975), respectively: Perceived Threat Vulnerability (PTV), Perceived Threat Severity (PTS), Self-Efficacy (SE), Response Efficacy (RE), Fear (F), Protection Motivation intention (PMI).

4. RESULTS AND DISCUSSIONS

During the testing process of the secondary research hypothesis (SH11 and SH12), a series of patterns were observed, which we state below, in correlation with the hypothesis subject to the testing process.

4.1. SH11 Hypothesis

The results analyzed according with the two periods (pre-Covid-19 and Covid-19), reveal the following particularities, summarized in Table 1.

Table 1. Results of analysis between the two periods (Pre-GDPR and GDPR)

PMT variables	Pre-GDPR (2017)	GDPR (2018-2021)
Perceived Threat Vulnerability (PTV)	Different perception with regards to education and IT profile.	Different perception depending on all four variables (gender, age, education and IT profile).
Perceived Threat Severity (PTS)	Different perception depending only at level of IT profile	Different perception depending on the level of gender, age and IT profile
Self-Efficacy (SE)	Different perceptions depending on age, education, and IT profile	Different perception by respondents according to age, and level of education
Response Efficacy (RE)	Different perception depending on all four variables (gender, age, education and IT profile).	Different perception by respondents according to age, and level of education
Fear (F)	Different perceptions depending on gender, age and IT profile	Different perception by gender and age
Protection Motivation Intention (PMI)	Differences in perception of respondents depending only on their education level	Differentiates the responses of responders according to gender and age

Source: authors' data collection and presentation

Based on the results summarized in Table 1, we can conclude with an assumed risk of 10% that the secondary hypothesis SH11 is confirmed. Consequently, the results prove that there are differences in users' perception of mobile applications regarding the six threats of the PMT theory, based on Gender, Age, Education and IT profile within the two analyzed periods (Pre-GDPR and GDPR).

Table 2. Similarities and differences between the two analyzed periods (Pre-GDPR and GDPR) with regards to the four variables

PMT variables	Pre-GDPR (2017)		GDPR (2018-2021)	
	Similarities	Differences	Similarities	Differences
Perceived Threat Vulnerability (PTV)	Gender Age	Education IT profile	-	Gender Age Education IT profile
Perceived Threat Severity (PTS)	Gender Age Education	IT profile	IT profile	Gender Age Education
Self-Efficacy (SE)	Gender	Age Education IT profile	Gender IT profile	Age Education
Response Efficacy (RE)	-	Gender Age Education IT profile	Gender IT profile	Age Education
Fear (F)	Education	Gender Age IT profile	Education IT profile	Gender Age
Protection Motivation Intention (PMI)	Gender Age IT profile	Education	Education IT profile	Gender Age

Source: authors' data collection and presentation

4.2. SH12 hypothesis

The results obtained after testing the SH12 hypothesis (Table 2) show that, in the pre-GDPR period compared to the GDPR period, there are no differences between the general perception of the respondents.

It is author's opinion that this is due to the fact that:

- the awareness level was high even since the pre-GDPR period and remained on high level during the analyzed period;
- the recipients have awarded maximum attention to all involved legislative changes and have been prepared to put them in action as soon as they were implemented.

Thus, the results obtained from the tests of statistical significance allow us to conclude that the secondary hypothesis SH12 is not confirmed.

5. CONCLUSIONS

The profile of respondents who scored higher than (or equal to) 3.5 (on scale 1-5 where 5 is the maximum value) for all six components of the PMT model is presented, in a comparative manner, below. We observe that the profile of the respondents:

- from the pre-GDPR period contains mostly female (88%) aged 18-22 (100%) that study Business (25%) and Social Sciences (25%) within their undergraduate (75%) specialization, have a non-IT profile (62%), use mobile equipment equipped with Android OS (100%) for 3-4 hours a day (37%) in order to communicate via social media (SM) platforms and e-mail (38%);
- from the GDPR period are mostly female (73%) aged 18-22 (90%), undergraduate students (84%) studying Business (54%), have a non-IT profile (76%), use mobile equipment equipped with Android OS (75%) for 5-6 hours a day (47%) for the purpose of online shopping and SM communication (51%).

From the above information we notice as significant differences that most respondents:

- in the period pre-GDPR are included ungraduated students who only have Android OS based mobile devices. They use the Internet on an average 3-4 hours a day for the main purpose of communication (SM and e-mail);
- while in the period GDPR, predominant still undergraduate students, but use mobile equipment equipped both Android (75%) and iOS(25%) OS and use the Internet on a higher rate per day (5-6 hours) not only for communication (SM, e-mail) but mainly for online shopping and learning.

As a general conclusion, we may state that during the period 2018-2021 the students invested in higher quality mobile devices (as the share of iOS devices increased with 25%) to keep up with the challenges of working and studying from home due to the Covid Pandemic (2020-2021). Compared to pre-GDPR period (2017), in the GDPR (2018-2021) period the respondents use their mobile devices not only to communicate via SM and e-mail but also to access a wide range of online services, such as e-shopping, e-learning, and other public services as the portfolio of online services and opportunities increased exponentially after 2017.

As for the PMT analysis, we noticed that the level of awareness remained within the undergraduate students (in both periods) due to the receptivity to the public media messages that both categories of students face during this last period of our analysis which included the Covid pandemic.

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THE LIBERALIZATION OF ELECTRICITY MARKETS IN ROMANIA AND IN THE EU

CRISTINA ONET

*Lucian Blaga University of Sibiu
Sibiu, România
cristina.onet@ulbsibiu.ro*

Abstract

The paper presents and analyzes the most important measures adopted by the European Union and Romania to ensure the establishment of electricity prices freely and on a competitive basis.

If the first part of the paper presents, from a historical perspective, the most important measures adopted by the European Union to achieve this goal, in the second part we analyze the measures recently adopted by Romania to define an energy strategy at national level, but also a coherent and articulated energy policy to provide crisis response tools. In this sense, the paper analyzes the role of the Romanian Energy Regulatory Authority (ANRE) as an autonomous administrative authority at national level and the Agency for the Cooperation of Energy Regulators (ACER), established at European level.

Last but not least, the paper presents the way the national electricity market is organized and operates, but also a series of statistical information provided by the Romanian Electricity and Gas Market Operator (OPCOM) to illustrate the types of energy markets that operate in Romania, as well as the most important information on the financial results obtained on these markets in 2021.

In conclusion, it can be seen that Romania is at the beginning of the road in terms of organizing free electricity markets. It has created all the necessary structures for the liberalization of the electricity market, but the regulation of their functioning will be done as it will face different realities that will demand appropriate measures. The legislative measures subject to the present analysis highlight the fact that they were undertaken in Romania in the context of their adoption at European level, but the current context of the energy crisis that manifests itself globally will force it to identify other concrete measures to intervene in the economy in order to alleviate the shocks caused by these crises.

Keywords: market liberalization; electricity; market surveillance authority; energy strategy; energy policy.

JEL Classification: Q41, Q43, Q48

1. INTRODUCTION ABOUT THE REGULARIZATION OF ELECTRICITY MARKETS IN ROMANIA AND IN THE EU

All over the world, the opening of electricity markets has sought to eliminate the natural monopoly and the vertical integration of the energy sector and to replace them with competitive mechanisms that give consumers the opportunity to freely choose their supplier. Thus, energy markets usually crystallize around a core of two main actors, namely the system operator, which ensures the technical coordination of the market, respectively the energy exchange, which ensures the coordination of the market at the commercial level. This core is joined by other market players: the transmission and distribution operators, the producers, the consumers and the electricity suppliers, the latter acting as intermediaries between the first two. A special category of suppliers is that of so-called aggregators, which buy or sell energy from and into the system, on behalf of several consumers, usually small household or commercial ones.

In the 1990s, when most of the national electricity and gas markets were still monopolies, the European Union and the Member States decided to gradually open up these markets to competition.

The first liberalization directives were adopted in 1996 (on electricity) and in 1998 (on natural gas), to be transposed into the legal systems of the Member States by 1998 (electricity) and 2000 (gas).

The second energy package was adopted in 2003, with the directives contained in it to be transposed into national law by the Member States by 2004, while some provisions came into force only in 2007. Industrial and household consumers have become free to choose their own gas and electricity suppliers from a wider range of competitors.

In April 2009, a third energy package was adopted, with the aim of further liberalizing the internal markets in electricity and gas, changing the second package and setting the cornerstone of the implementation of the internal energy market.

Thus, through the Strategy for an Energy Union published by the European Commission in 2015, five interdependent, mutually reinforcing dimensions have been identified, designed to help strengthen sustainability, competitiveness and energy security, namely:

- energy security, solidarity and trust;
- a fully integrated European energy market;
- energy efficiency in support of demand moderation;
- decarbonization of the economy;
- research, innovation and competitiveness.

In order to provide consumers with safe, sustainable, competitive and affordable prices energy, the Commission presented the "Clean Energy for All Europeans" package on 30 November 2016.

In June 2019, the fourth energy package was adopted, which includes Directive no. 944/2019 concerning electricity and three regulations: Regulation no. 943/2019 of the EU concerning electricity, Regulation no. 941/2019 of the EU concerning the risk preparation and Regulation no. EU Regulation 942/2019 concerning the Agency for the Cooperation of Energy Regulators (ACER).

This energy package introduces new rules on the electricity market to meet the needs of energy from renewable sources and to attract investment. It provides incentives for consumers and sets a new limit for power plants to be eligible for subsidies as capacity assurance mechanisms. In addition, it imposes on Member States the obligation to draw up emergency plans for potential power crises and increases ACER's powers in cross-border regulatory cooperation, where there is a risk of national and regional fragmentation.

Regulation no. 943/2019 on the internal market of electricity, revises the rules and principles of the internal market of electricity to ensure its proper functioning and competitiveness. At the same time, it supports the decarbonisation of the EU energy sector, removes barriers of cross-border trade in electricity and makes possible the EU's transition towards a clean energy, according to the commitments made in the Paris Agreement.

The Regulation defines a set of market-based principles regarding the functioning of electricity markets, as follows:

- prices will be formed according to demand and supply;
- customers will benefit from market rules and will be active market participants;
- the incentives for the generation of decarbonized electricity will be based on the market;
- barriers to cross-border flows of electricity will be progressively eliminated;
- producers will be directly or indirectly responsible for their electricity sales;
- new conditions will be established regarding the establishment by Member States of capacity assurance mechanisms, as well as the principles for their creation.

The Directive no. 944/2019 on common rules for the internal market in electricity, focuses on Member States and consumers, defining in turn a set of rules that approach various issues, as follows:

- suppliers must be free to set the price at which they supply electricity to customers;
- Member States must ensure market-based price competition between suppliers;
- states will ensure the protection of vulnerable household customers affected by energy poverty;

- the right of final consumers to electricity supplied by a supplier will be guaranteed, subject to the agreement of the supplier, regardless of the Member State in which the supplier complies with EU requirements is registered;
- consumers will be able to request the installation of smart electricity meters without additional costs;
- household customers and micro-enterprises will have free access to at least one tool for comparing suppliers' offers, including offers for the supply of electricity contracts with dynamic prices;
- household customers and micro-enterprises will have the right to change suppliers free of charge within a maximum of three weeks and to participate in collective change of supplier programs;
- end consumers with smart meters will be able to request contracts for the supply of electricity at dynamic prices with at least one big supplier;
- final consumers will have the right to act as active customers (for example through the sale of self-produced electricity), without being subject to disproportionate or discriminatory technical requirements, having a clear summary of the contractual conditions.

The Regulation no. 941/2019 on risk preparation, aims to ensure better risk preparation by encouraging cooperation between transport and system operators within the EU, those from neighboring countries and ACER. It facilitates the cross-border management of electricity networks in the event of a power crisis, through the new regional operational centers, which have been introduced in the related regulation proposal concerning the internal market in electricity.

The European Network of Transmission System Operators for Electricity (ENTSO-E) is developing and proposing a common methodology for risk identification, in cooperation with ACER and the Energy Coordination Group, which will be subsequently approved by ACER. Four sets of measures have been proposed:

- common rules on electricity crisis prevention and preparation, in order to ensure cross-border cooperation;
- common rules for crisis management;
- common methods of risk evaluation related to security of supply;
- a common framework for better evaluation and monitoring of security of electricity supply.

The Fifth Energy Package, entitled "Implementing the European Green Pact", was published on 14 July 2021, with the aim of aligning the EU's energy targets with the new European climate targets for 2030 and 2050 (European Commission, 2021). On that date, the Commission published the first part of the package, which aims to reduce greenhouse gas emissions with at least 55% and achieve the goal of building a climate-neutral Europe by 2050. The debate on the fifth energy package is under way and is deeply affected by the energy crisis,

which has been exacerbated by the war in Ukraine and the economic sanctions imposed by the European Union on Russia.

2. THE EUROPEAN AGENCY FOR THE COOPERATION OF ENERGY REGULATORS

By the Regulation (EC) No 713/2009 of the European Parliament and of the Council establishing the European Union Agency for the Cooperation of Energy Regulators (ACER) was set up and became operational in March 2011. ACER is mainly responsible for promoting cooperation between national regulatory authorities, at regional and European level, and oversee the development of the electricity and natural gas network and internal markets. It is also competent to investigate cases of market abuse and to coordinate with Member States the application of appropriate sanctions.

In June 2019, the Commission adopted a new Regulation (EU No 942/2019) to reform ACER and legal acts and strengthen its key role as coordinator of the actions of national regulators, especially in areas where fragmented national decision processes with cross-border relevance would lead to problems or inconsistencies for the internal market. The responsibilities of ACER in the field of wholesale market surveillance and cross-border infrastructure have been extended to give it greater responsibility for drawing up and submitting to the Commission the final proposal for a network code and to influence the process of reviewing the regional market electricity (supply area), provided by the Regulation no. 943/2019 on electricity. The ACER Regulation (942/2019 / EU) introduces fees as additional sources of funding in order to cover the costs of REMIT-related activities ("REMIT fees") carried out by ACER. On 15 July 2020, DG Energy and ACER presented a proposal for a fee structuring. On 17 December 2020, the Commission adopted the Decision no. 2152/2020 / EU on fees, which aims to cover the costs of operations carried out by ACER, such as the collection, use, processing and analysis of information.

3. THE NATIONAL ENERGY STRATEGY AND POLICY

According to art. 4 paragraph (1) of Law no. 123/2012 on electricity and natural gas, the national energy strategy defines the medium and long-term objectives of the electricity sector and the most efficient ways to achieve them, in the conditions of ensuring a sustainable development of the national economy and meeting the energy needs and a civilized standard of living, in terms of quality, both now and in the medium and long term, at an affordable price. The energy strategy is developed by the relevant ministry consultation the representatives of the energy industry, non-governmental organizations, the social partners and representatives of the business environment and is approved by the Government. The energy strategy is periodically reviewed, at the initiative of the relevant ministry, without prejudice to the specific stability and

predictability of such a document, the revised form to be approved in accordance with the law.

"Romania's Energy Strategy 2020-2030, with a view to 2050" (Ministry of Economy, Energy and Business Environment, 2020) is a programmatic document that defines the vision and establishes the fundamental objectives of the development process of the energy sector.

The objectives of the strategy support the achievement of the national targets assumed at the level of **2030**, namely:

- 43.9% reduction of emissions related to ETS sectors compared to the level of 2005, respectively a reduction by 2% of emissions related to non-ETS sectors compared to the level of 2005;
- 30.7% share of energy from renewable sources in the final gross energy consumption;
- 40.4% reduction in final energy consumption compared to the PRIMES 2007 projection.

The objectives of the Energy Strategy are:

1. to ensure the access to electricity and heat for all consumers;
2. clean energy and energy efficiency;
3. to modernize the corporate governance system and the institutional regulatory capacity;
4. to protect the vulnerable consumer and reduction of energy poverty;
5. competitive energy markets as a basis for a competitive economy;
6. to increase the quality of energy education and the continuous training of qualified human resources;
7. Romania, regional energy security provider;
8. to increase Romania's energy contribution on regional and European markets by capitalizing on national primary energy resources.

The eight strategic objectives of the Romanian energy sector are concretely expressed through a set of operational objectives (OP). In turn, the operational objectives are pursued through priority actions (PAs).

Romania's Energy Strategy vision is based on achieving the eight strategic objectives and implementing a priority investment program in order to meet the objectives and targets set for 2030, throughout the national energy system (SEN).

The Energy Strategy establishes the fact that Romania will maintain its position as an energy producer in the region and will play an active and important role in managing stress situations at the regional level.

According to art. 4 par. (2) of Law no. 123/2012 on electricity and natural gas, the energy policy, following the directions established by the energy strategy, is implemented by the relevant ministry, based on the Government Program, for a medium time and with consideration on likely long-term developments, in consultation with economic operators from the field of

electricity, the non-governmental organizations, the social partners and the representatives of the business community, taking into account, mainly, the following:

- a) the establishment of the appropriate institutional framework, by defining the bodies and authorities competent to implement this policy;
- b) the ensuring of the legal framework necessary for the safe and stable operation of SEN (National Energy System);
- c) the ensuring of the security in the supply of fuels and electricity and safety in the operation of SEN;
- d) the ensuring of the protection of the environment, the ecological reconstruction of the sites affected by energy activities;
- e) the transparency of the fuel and energy prices and tariffs;
- f) the increasing of energy efficiency;
- g) the promotion of energy from renewable sources, from unconventional sources, high-efficiency cogeneration and energy storage, with priority given to electricity supply for isolated settlements;
- h) the development of international cooperation in the field of energy, the participation in the regional markets and the European electricity market, in order to achieve the single energy market at the level of the European Union and to ensure the safe and secure operation of SEN.

Last but not least, through art. 4 paragraph (7) of Law no. 123/2012 on electricity and natural gas establishes that energy policy is materialized in a program comprising measures to stimulate investment activities, research and development, sustainable development, efficient use of energy resources, energy efficiency and other activities in order to guarantee the safety and security in the operation of SEN (National Energy System), approved by Government decision, with the obligation to comply with the implementation of annual programs.

As it can be seen, in Romania it is the state that initiates and implements the national energy policy. At the same time, the large companies in which the state is the majority shareholder represent the spine of the National Energy System. Taking into account the geographical and strategic positioning of Romania, as well as the development vision of the energy sector, these companies have the potential and the conditions to become companies with an important role in ensuring energy security and system services, at regional level.

Also, as an asset owner, the state needs to improve the management of the companies in which it holds shares. The state-owned energy companies need to become more efficient, to professionalize their management and to modernize.

According to Eurostat data published in April 2020, Romania had in 2019 (semester 2) the sixth lowest average EU price of electricity for household consumers (annual consumption band between 2,500-5,000 kWh). However, given the relatively low purchasing power, affordability of price is a major issue, leading to high levels of energy poverty, and consumption is also affected by the

fact that almost 100,000 homes in Romania (some of which are not permanently inhabited) are not connected to electricity network.

4. THE NATIONAL ENERGY REGULATORY AUTHORITY (ANRE)

The National Energy Regulatory Authority (ANRE) is an autonomous administrative authority, with legal personality, under parliamentary control, fully financed from its own revenues, decisional, organizational and functional independent, having as object of activity the elaboration, approval and monitoring of the application of the obligatory regulations at national level necessary for the functioning of the sector and the market of electricity, heat and natural gas in conditions of efficiency, competition, transparency and consumer protection.

According to art. 7 ¹ of the Law no. 123/2012 on electricity and natural gas, ANRE monitors the implementation of the rules regarding the roles and responsibilities of transmission and system operators, distribution operators, suppliers, customers and other participants on the market in accordance with Regulation (EU) No 182/2011. 943/2019. At the same time, ANRE monitors the management of congestion within the national electricity systems and the implementation of congestion management rules. In this regard, transmission system operators or market operators shall submit to ANRE their congestion management rules, including those for capacity allocation, with ANRE having the right to review and request changes to these rules. Rules for congestion managing within interconnection capacities are established by all regulators or the Agency for the Cooperation of Energy Regulators (ACER).

In order to fulfill its obligations, ANRE has the right:

- a) to request information from the regional coordination centers;
- b) to carry out inspections, including unannounced inspections, at the premises of the regional coordination centers;
- c) to issue compulsory decisions for the regional coordination centers.

In order to ensure compliance with a decision taken, ANRE may request the approval of ACER, in accordance with network codes and national and European regulations.

At the same time, in fulfilling its attributions, ANRE is entitled to resolve the complaints against the transport and system operator and against the distribution operators regarding the obligations they have. It will do so by issuing a decision within 60 days of the date of registration of the complaint, with the possibility of an extension of another 60 days, if the authority needs additional data. This extended period may be further extended by a maximum of 60 days, with the consent of the applicant. The start of the process of resolving the complaints by ANRE does not affect the right of the petitioners to address the courts for the settlement of the same complaints. Disputes between the

transport and system operator and the transmission system owner shall be subject to the same procedure.

The relations of cooperation and exchange of information between ANRE and ACER and, respectively, between ANRE and the other regulatory authorities within the European Union is established with the same level of confidentiality of information as the one imposed on the issuing authority. ANRE will cooperate at least regionally with other regulators.

ANRE is also required to implement the rules on the roles and responsibilities of transport system operators, distribution system operators, suppliers, customers and other market participants, in accordance with Regulation (EU) No 943/2019.

ANRE may inform the European Commission if it considers that a decision relevant to cross-border trade, taken by another regulatory authority, does not comply with the guidelines issued by the European Commission or with the provisions of the Regulation (EU) no. 2019/943, within 60 days from the date of that decision, if there is sufficient information on such a situation. In this regard, ANRE must comply, within 60 days, with a decision of the European Commission requiring the withdrawal or dismissal of a decision of ANRE and inform the European Commission accordingly.

In the activity of monitoring the electricity market, ANRE publishes on its website quarterly reports on its operation. Thus, ANRE must ensure the increase of information and awareness of the rights of final customers of electricity in their relation with the economic operators participating in the electricity market and take all necessary measures to provide them with practical information.

Another essential task of ANRE for the proper functioning of a liberalized market for electricity is established by Article 7 ^ 4 paragraph (1) of Law No. 123/2012 on electricity and natural gas. Thus, it was obliged to create and administrate an interactive web application designed to serve as a tool for comparing energy supply offers in order to provide users connected to the national energy system with an independent, equidistant and non-commercial tool for comparing energy supply offers.

The tool of comparison must meet at least the following requirements:

- a) establishes and sets out the clear and objective criteria on which the comparison is based, including services;
- b) uses clear and unambiguous language;
- c) provides clear and up-to-date information and specifies the time of the last update;
- d) is accessible to people with disabilities, being easy to identify, functional, easy to understand and stable;
- e) provides an effective procedure to report incorrect information on published tenders;

- f) makes comparisons, limiting the requested personal data to the data strictly necessary for comparison.

Such instruments may be administrated by any entity, including private companies and public authorities or bodies.

According to art. 7 ^ 5 of the Law no. 123/2012 on electricity and natural gas, ANRE monitors market developments, assesses the risks that may be involved in offers and contracts of electricity at dynamic prices and takes measures regarding abusive practices. To this end, it monitors and publishes an annual report by 31 July on the main developments concerning these contracts, including dynamic market offers and the impact on consumer invoices and, explicitly, the level of price volatility. This report shall be drawn up for at least 10 years from the time the dynamic supply contracts become available.

Last but not least, in order to digitize the activity of changing the supplier, ANRE realizes and operates an integrated IT platform, unique at national level, through which the change by the final customer of the electricity supplier is achieved. Licensees involved in switching electricity supplier have the obligation to provide the data and information necessary for the realization and operation of the platform.

ANRE may delegate the operating activity to a service provider that is not affiliated with a supplier or operator of an electricity network.

5. THE ORGANIZATION AND FUNCTIONING OF THE NATIONAL ELECTRICITY MARKET

Law no. 123/2012 of electricity and natural gas firmly establishes by art. 20 the fact that the electricity market is competitive and that energy transactions are made wholesale or retail.

In this context, the Dispute Resolution Commission is established, as a body that resolves disputes on the wholesale and retail market that appeared between the participants in the electricity market. The Dispute Resolution Commission has 5 members, who are named by the ANRE president decision for a period of 3 years, among the ANRE specialists with at least 8 years of experience in the electricity sector. The Commission works based on an organization and operation regulation, approved through ANRE president order, after public consulting. The participation of the economic operators in the field of electricity to alternative dispute resolution mechanisms for household customers is mandatory.

According to art. 21 of Law no. 123/2012 on electricity and natural gas, the participants in the electricity market must comply with the rules of its operation issued by ANRE and make payments for electricity and services they benefit from, as results of transactions carried out in accordance with these rules, at the due dates provided in the contracts concluded between the parties.

Market participants are obliged to assume the financial responsibility for the payment of the imbalances they generate on the electricity market, to comply with the provisions of the licenses and regulations issued by ANRE. Balancing responsibility does not apply to consumers with an installed production capacity of electricity of less than 400 kW. It belongs to their supplier, according to ANRE regulations.

Customers are obliged to pay the equivalent value of the bills for electricity and for the services they receive, within the due dates provided in the contracts concluded between the parties, as well as the establishment of financial guarantees in order to avoid the risks of non-payment on the electricity market.

Electricity market participants must notify the transport and system operator the imports, exports and transits at trading intervals, with external partners, on each border.

Also, the participants in the electricity market must notify the transport and system operator the information necessary for it to fulfill its duties under this law, including the reciprocal net quantities contracted, according to ANRE regulations and procedures issued by the transmission and system operator, in accordance with the provisions of European legislation.

Last but not least, the participants in third country markets operating in the national electricity market, must comply with European Union law and applicable Romanian law, including the rules on environmental and security policy.

According to art. 23 of Law No. 123/2012 on electricity and natural gas, on the wholesale market can be concluded, at all times, at least the following types of transactions:

- a) directly negotiated bilateral transactions;
- b) transactions concluded following the conduct of auctions on organized markets, including the electricity balancing market;
- c) electricity import and export transactions.

Market participants have the right to trade energy as close as possible to real time and at least until the closing time of the intraday inter-zonal market, with the possibility to trade energy in intervals at least as short as the imbalance settlement interval, both in the markets for the next day and in the intraday markets.

In order to allow the protection of the market participants from the risks of market-based price volatility and to reduce the uncertainty about the future return on investment, long-term coverage products are traded on a stock exchange in a transparent manner and supply the long-term contracts are traded on over-the-counter markets, on the respect of the European competition law.

The designated operator of the electricity market shall supply products for market trading for the next day and in the intra-days markets which are small enough, with a minimum supply size of 500 kW or less, to enable the effective

participation of dispatchable consumption, the storage of energy and small-scale renewable energy sources, including direct customer participation.

In the electricity market, the transport system operator acquires system and capacity and energy services, respectively.

In the retail market, suppliers sell electricity to final customers through bilateral contracts, at prices negotiated or established through standard offers.

Relevant data such as duration, rules on delivery and settlement, quantity, execution times, transaction prices, means of identification of the wholesale customer, on all transactions from the supply contracts and derivative instruments in the field of electricity drawn with wholesale customers and with transport system operators shall be kept by suppliers for at least 5 years and shall be made available to ANRE, the European Commission and other competent national authorities at their request.

The obligation to keep data relating to transactions from derivative financial instruments are apply in accordance with the provisions of the guidelines published by the European Commission. These data may be published by ANRE, respecting the confidentiality of commercially sensitive data.

The participation on any electricity market is voluntary.

6. THE OPERATOR OF THE NATIONAL ELECTRICITY MARKET

The Romanian authorities, together with the participants in the internal energy market (ex: OPCOM, Transelectrica, etc.) are involved in the initiatives meant to facilitate the integration of the electricity market at regional level, respectively in the process of implementing the Regulation (EU) no. 1222/2015 setting guidelines on capacity allocation and congestion management, in the context of the creation and operation of the "Single Day-Ahead Coupling (SDAC) and the "Single Intra-Day Coupling "(SIDC), also involving the related contractual framework.

The Operator of the Electricity Market (OPCOM) is a joint stock company with full state capital that was established by the H.G. no. 627/2000. Its shareholders are composed as follows: 97.84% of the share capital belongs to the National Electricity Transmission Company - Transelectrica S.A. and 2.16% of the share capital belongs to the Romanian State represented by the General Secretariat of the Government.

Since September 2000, the wholesale market for electricity and system services in Romania is managed by S.C. OPCOM S.A. under the conditions of the primary and secondary legislation in force. According to it, the Company Operator of the Electricity and Natural Gas Market "OPCOM" S.A. fulfills the role of administrator of the electricity market, providing an organized, viable and efficient framework for conducting commercial transactions in the wholesale electricity market and carries out activities of centralized markets in the gas

sector, in conditions of consistency, fairness, objectivity, independence, equidistance, transparency and non-discrimination.

The main activities carried out by OPCOM in the field of electricity according to the provisions of the primary legislation (Law no. 123/2012 concerning electricity and natural gas) and secondary legislation (GD no. 627/2000 concerning the reorganization of the National Electricity Company S.A.) are:

- the exercise of organizing and managing activity for the centralized electricity markets;
- the exercise of the settlement operator function, by carrying out the settlement operations for the Next Day Market and the Intraday Market, respectively by establishing the payment obligations and / or collection rights for the Balancing Market and the quantitative and value imbalances of the parties responsible for balancing;
- the exercise the function of organizer and administrator of the green certificates market;
- the exercise of the function of the Platform for trading greenhouse gas emission certificates administrator;
- the exercise of the activity of centralized markets administration in the natural gas sector;
- the activity of supervising the functioning of the managed markets;
- the collection and publishing of the market statistical data, according to the provisions of the Energy Law.

OPCOM has been qualified by ACER as a Registered Reporting Mechanism, in order to report the offers and transactions established by the participants in the wholesale energy market in Romania.

From the perspective of its field of activity and responsibilities, OPCOM is a member of the International Energy Exchange Association (APEX), the European Energy Exchange Association (EUROPEX), other committees and national associations.

In order to guarantee to third parties and the authorities involved the quality of the services provided under the licenses held, OPCOM applies a Quality Management System certified by Lloyd's Register Quality Assurance. At the same time, in order to guarantee the security, confidentiality and availability of information to interested parties, OPCOM implements an Information Security Management System certified by Lloyd's Register LRQA.

OPCOM shall also take the necessary steps to fulfill its mission of providing the reference prices for electricity and gas, as well as the forward price signals for electricity and gas and to ensure the market conditions as a whole, necessary for the fulfillment of the objectives of the national energy strategy and meant to increase the transparency and overall integrity of the Romanian

wholesale energy market, supporting the process of market completing and liberalization and its integration into the European single market.

Therefore, OPCOM organizes and supervises the following specialized electricity markets:

- a) the Next Day Market (DAM);
- b) the Intraday Market (IP);
- c) the Centralized Market of Bilateral Contracts - PCCB-NC trading method;
- d) the Centralized Market with continuous double negotiation of bilateral electricity contracts (PC-OTC);
- e) the Centralized Market for Universal Service (PCSU);
- f) the Centralized Market for electricity from renewable sources supported by green certificates (PC-ESRE-CV);
- g) the Anonymous Central Market Spot of Green Certificates (PCSCV).

Having as objective the fulfillment of the priority objective of integration in the European internal market, Romania will continue the collaboration with the contracting parties from the Energy Community in the context of their accession to SDAC and SIDC. We mention on this occasion that the electricity markets of the countries of Central and Eastern Europe (Hungary, Czech Republic, Slovakia and Romania) were linked in June 2021 to the markets of Western Europe and since then they operate in a regime coupled with those of Poland, Austria and Germany. Also, the coupling operations related to the Romanian-Bulgarian border in SDAC were launched on October 27, 2021, with the first delivery day October 28, 2021, considering that the interconnections between Greece and Bulgaria, respectively between Greece and Italy, were already operational. We mention, on this occasion, the Core Flow-Based Market Coupling Project, which aim is to achieve, develop and implement a "Market for the Next Day" flow-based coupling throughout the Core Region (Austria, Belgium, Croatia, Czech Republic, France, Germany, Hungary, Luxembourg, the Netherlands, Poland, Romania, Slovakia and Slovenia), as part of the next day's single market coupling project (SDAC).

7. CONCLUSIONS

In conclusion, it can be seen that Romania is at the beginning of the road in terms of organizing free electricity markets. It has created all the necessary structures for the liberalization of the electricity market, but the regulation of their functioning will be done as it will face different realities that will ask for appropriate measures.

The legislative measures subject to the present analysis highlight the fact that they were undertaken in Romania in the context of their adoption at European level, but the current context of the energy crisis, that manifests itself globally, will force it to identify concrete measures of intervention in the

economy, in order to soften the shocks caused by all the energy crises that will follow.

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CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT: ISSUES FOR INTERNATIONAL TRADE SYSTEM

OLESEA PLOTNIC

*Henri Capitant Legal Culture Association of Moldova
Chişinău, Republic of Moldova
plotnicolesea.aum@gmail.com*

LUCIA POPESCU

*Moldova State University
Chişinău, Republic of Moldova
popescu.lucia.eu@gmail.com*

Abstract

In the context of implementing the United Nation Agenda 2030 on Sustainable Development Goals (SDG), as well as climate change policies and strategies adopted by several states, many countries go through the process of changing the markets for a green economy. Although such changes lead to positive impact for the environment, international trade market faces several legal and economic challenges. Following the analysis of United Nation and other relevant international documents and policies, their features and impact, as well as different opinions and considerations of academia, the research will provide a detailed presentation of the legal challenges faced by private companies in the context of sustainable development. In addition, the legal particularities of private sector's activity in the context of SDGs will be stresses and recommendations provided. The recommendations will focus mainly on concrete measures to include sustainable goals through practices for all services, products, resources and manufactures of entrepreneurial activity.

Keywords: *sustainable development; international trade; green economy; climate change.*

JEL Classification: K12, K20

1. INTRODUCTION

In recent years, the climate stabilization, and Sustainable Development Goals (SDG) are highly discussed in the context of the 2030 Agenda for Sustainable Development (Leadership Council of the Sustainable Development Solutions Network, 2014), considering its positive effects on decreasing pollution. The concept of sustainable development or green economy “carries the promise of a new economic growth paradigm that is friendly to the earth’s ecosystems and can also contribute to poverty alleviation”, as underlined by the United Nation. However, it could entail challenges and risks for trade market,

especially for developing countries. The main challenges and risks faced by companies are the need to use natural resources in their activity, which is against the concept of green economy; insufficient skilled human resources able to apply in practice innovative business solutions; weak/undeveloped financial markets, which would support businesses with financial aid and benefits or tax exemption; and limited local buying power, which would satisfy the market's offer.

The current paper has four key objectives: the first one focuses on analysis of standards and policy implications related to climate change and SDG, as well as the need to make the transition to the green economy. The second, investigates the legal challenges faced by international trade in the context of SDG implementation. The third, examines the legal particularities of private companies' activity in the context of SDG, in particular positive business impact will be reflected. The fourth part will provide conclusions and key recommendations for existing entrepreneurial activities suitable to SDG context.

The actuality and originality of this theme lies in the 2030 Agenda for Sustainable Development (Leadership Council of the Sustainable Development Solutions Network, 2014), which is an urgent call for actions for all countries. Although, all United Nations Member States adopted it in 2015, most of the countries haven't reached all objectives outlined in the document. The implementation process revealed to be complicated and facing several risks and challenges.

In the preparation of this paper, it was used the logical method to analyse and interpret the UN legal standards and international policies and materials, as well as doctrine. In addition, the comparative method was used to perform an analysis of UN and other international standards and policies with doctrine and international trade practice. At the same time, the synthetic analysis method contributed to the formulation of conclusions and recommendations to be followed for successful business or in adjusting existing businesses in the context of the SDG.

2. STANDARDS AND POLICY IMPLICATIONS RELATED TO CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT

Before analyzing the standards related to sustainable development and climate change, it is essential to understand what sustainable development is and what features it entails.

The first discussions on the sustainable development and climate change were held by the World Commission on Environment and Development, which approved in 1987 the Report of the World Commission on Environment and Development: Our Common Future (World Commission on Environment and Development, 1987, p. 13). The document is considered a milestone in triggering international awareness and discourse on the importance of global

sustainable development, including for the first definition of sustainable development. According to this document, sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

It includes two key concepts: the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs (World Commission on Environment and Development, 1987, p. 41). It could be observed that the SDGs could be seen as being achievable, since they could be implemented in coordinated manner with other countries, with less focus on national goals and purposes. That is why it would be beneficial to develop agreements on international level, which would regulate the differences between countries in process of development and the ones already developed.

At the same time, this paper will be limited only to mentioning the appearance of the first relevant discussions on sustainable development, without delving into the historical development in terms of standardization, but on the contrary, will refer to recent international documents on this topic.

In this context, the central document to which reference will be made in this paper is the 2030 Agenda for Sustainable Development (hereinafter "2030 Agenda"), adopted during the United Nations (hereinafter "UN") Sustainable Development Summit in September 2015. As stated by UN, the 2030 Agenda provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests", including by means of establishing a collaborative partnership between state and non-state actors in the global South and North (Tosun and Leininger, 2017, p. 1).

The first idea of SDGs came up following the United Nations Conference on Sustainable Development (Rio+20) in Rio de Janeiro, Brazil, in June 2012, where "The Future We Want" document was adopted to launch a process to develop the SDGs. The need for the SDGs was determined by the most serious issues affecting the entire world: firstly, the world was still affected by extreme poverty; secondly, human societies irreparably affect the planet and the environment; thirdly, inequality among and between states has become increasingly evident; and finally, the governing process has become more complex due to technology development (Leadership Council of the Sustainable Development Solutions Network, 2014). In this context, the urgent need for

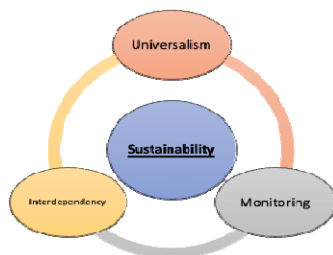
action from the side of Governments was acknowledged as being essential to avoid quick escalation of identified issues.

For the development of SDGs the Open Working Group (hereinafter “OWG”) was created by the UN in order to manage the elaboration process. The OWG included representatives of 30 UN nations. The OWG identified 19 “focus areas” which cover: 1. poverty eradication, 2. food security, 3. health and well-being, 4. quality education, 5. gender equality, 6. clean water and sanitation, 7. affordable and clean energy, 8. decent work and economic growth, 9. industry, innovation and infrastructure, 10. reduced inequalities, 11. sustainable sites and communities, 12. responsible consumption and production, 13. life below water, 14. life and land, 15. peace, 16. justice and strong institutions. All these goals are broken-down in smaller objectives.

As it can be observed, the SDG represents an ambition document different from their predecessors, the Millennium Development Goals (hereinafter “MDGs”) - implemented in the period of 2000-2015. The MDGs referred to regulatory and political system, as well as aid- and civil society organisations, without providing for any role to private sector. It must be acknowledged, however, that the MDGs was a successful document, which had a great impact on poverty reduction with more than 50 % (Pedersen, 2018). In contrast, the SDGs aims not only to reduce poverty, but also to address and pursue human and sustainable development in an integrated manner following the global economic and financial crisis that affected the entire world in 2007-2008, as well as the acknowledgement of risks related to climate change (Tosun and Leininger, 2017).

In this connection, the SDGs provides for business opportunities, by using of new technologies and relaying on innovation and market development. At the same time, SDGs offers guidance for sustainable business models and change of activity in a sustainable one, as well as how to avoid any risks and unnecessary costs (Pedersen, 2018). At the same time, the implementation process of SDGs is different from the one of the MDGs and involves certain specific particularities as presented in the Figure 1.

Figure 1. Implementation particularities of SDGs



Source: authors' own contribution

- 1) The universalism, is the first feature underlined by doctrine as the leading one in the implementation process of the Goals, which means that governments of all countries, regardless of their economic situation, shall implement the 2030 Agenda.
- 2) The interdependency of the Goals is the second feature of priorities and objectives of SDGs, which means that the Goals are implemented in an integrated and coherent manner.
- 3) The monitoring is the third specific feature obligatory for the entire implementation process of SDGs, which shall be supported by an evaluation mechanism (Tosun and Leininger, 2017, p. 2).

From the initial stage of SDGs implementation, an essential aspect was addressed in relation to the implementation process, particularly the policy coherence in respect to the SDGs. This coherence was considered as being achievable by adopting one of the following options:

- Issuance of policy measures that would realize the goals of two or more policy areas or,
- Assessing the effects, the policy goals in one area can have on reaching the goals in another area.

In this respect, several studies were carried out, for instance how the SDGs relate to each other, specifically the Goals referred to food, water and energy security, including health and societies' capacities to adapt and reduce climate change (Tosun and Leininger, 2017). It is essential to emphasize that the European Union (EU) has an important role in implementing the 2030 Agenda by including the SDGs in EU policies and recommending the EU member states to follow the same approach. Moreover, the EU is carrying out its own supervisory process on SDGs fulfilment by each member state, based on several indicators developed. In this context, the EU issued numerous policies, among which are the European Green Deal adopted in 2020, which is a set of policy initiatives issued by the European Commission to make the EU climate neutral by 2050; Annual Sustainable Growth Strategy 2020; Green Deal Investment Plan; New Industrial Strategy for Europe; New Circular Economy Action Plan, European Commission's Action Plan on Financing Sustainable Growth and the regulation on a new taxonomy for sustainable activities, etc.

It is, however, important to take into consideration that the implementation of the SDG depends on each Government of states, which have their own interpretation of the goals and correspondingly, different approaches in respect to the implementation process, especially towards interlinks between different goals. It is a difficult process, which entails not only legal, but also social, economic and environmental aspects, including responsibility and coordination. Although there are less than 8 years remained to achieve the 2030 Agenda, there

are many countries which encounter high difficulties, of different nature and intensity, in implementing the SDGs.

An eloquent example in this respect are the recent legislative measures taken by the Dutch Government to reduce nitrogen oxide and ammonia emissions from farmers' herds, which means reducing the number of animals by about 30%. These measures, however, severely hit farmers, which led to large-scale riots in the Netherlands (which spread in Germany and Italy), forcing the Government to rethink its actions (Pole, 2022).

In this context, each country has to carefully analyze its own circumstances to effectively and efficiently implement SDGs, while it might need to break usual practices of “growing first and cleaning up later”. In this regard, the UN rightly mentioned that the universal transformation towards sustainable development in the next decade depends on the simultaneous achievement of country's specific innovative pathways. (...) Scientific knowledge allows for the identification of critical pathways (...), and there are numerous examples from across the world that show that it is possible (Independent Group of Scientists appointed by the Secretary-General, 2019).

When talking about the difficulties of adopting of certain measures at the national level, it is equally important to address those that may arise at the international level. For instance, the lobbying carried out by key players in the European auto parts manufacturing sector, who aim hinder or delay EU policies designed to decarbonize the transport sector (Cullen, 2022). Such lobbying might have a great impact on EU legislative process. For example, recently the European Parliament voted against adopting a revision of the EU emissions trading system under the European Union's Fit for 55 packages, which aims to reduce greenhouse gas emissions to try to prevent the dangerous impacts of the climate crisis. This decision, which, contradicts the EU original ambition (Boland, 2022), is considered the direct effect of lobbying carried out by different trade associations and companies during numerous meetings with EU lawmakers (Simon, Taylor and Romano, 2022).

In this context, it could be ascertained that the SDGs is a complex and comprehensive document which, as specified by doctrine, formed the overarching international political vision relating to sustainability during the lifetime of the new Future Earth initiative. As such, if Future Earth is serious about working with stakeholders to develop solutions to global challenges, close links to the SDGs are essential (Owen, 2014, pp. 20-22).

3. LEGAL CHALLENGES FACED BY INTERNATIONAL TRADE IN THE CONTEXT OF SDGs IMPLEMENTATION

Different countries encounter several challenges in implementing the SDGs, some at a higher level, other at a lower. Those countries which face the most challenges are less contacted to EU and as observed by doctrine, in these

countries persist one or more specific features such as less green minded population, lack of political will or powerful lobby for green economy etc. (Lockwood, 2014). Before analyzing the legal challenges, it is essential to understand what are the right policies and strategies that would benefit the international trade in the SDGs context.

In general, international trade is environmentally friendly when it includes practices against emissions, where natural and/or organic products are used to build its facilities, and resources are used efficiently, including their recycling. Environmentally friendly businesses shall be based on policies and practices, which improve the life quality of the population. The doctrine provides the key relevant features that should govern strategies and policies, which include, but are not limited to:

- Strategies and policies must include principles and practices of sustainable development;
- Strategies and policies shall be based on technology, which shall be green and adaptable;
- Strategies and policies shall provide control over use of natural resources;
- Strategies and policies shall make prices in way which will reflect environmental values, but which will not affect the poor (for services and products which are essential for leaving);
- Strategies and policies shall provide appropriate support through subsidies, access to credits and protection;
- Strategies and policies should give preference to investments that contribute to sustainable development priorities of the country;
- Strategies and policies shall allow the adoption of any measures necessary for the protection of human, animals or plant life and health, as well as conservation of natural resources (Ayunisari, 2011);
- Strategies and policies should eliminate discrimination and reduce stigmatization of certain groups.

In addition, apart from the adoption of 2030 Agenda on SDGs, UN member states have to reflect them in all relevant legal framework governing different areas as economic, social protection, environment, science and technology etc., which involves not only revision of many laws, but also existing business practices, which may be the most complicated challenge. A good example in this respect is the EU-Moldova Association Agreement, which provides at article 86, that Parties shall develop and strengthen their cooperation on environmental matters, thus contributing to the long-term goal of sustainable development and greening the economy (Association Agreement between the European Union and the European Atomic Energy Community and their Member States, of the one part, and the Republic of Moldova, of the other part, 2014). By circular economy, increased environmental protection will benefit citizens, as consumers

and businesses in the EU and the Republic Moldova, including by improving public health, by conserving natural resources, by increasing economic and environmental efficiency by integrating the environment into other policy areas, as well as using modern, cleaner technologies that contribute to the models of more sustainable production. However, although the implementation of the Association Agreement has started and several reforms and changes have been performed, according to the last reports on the implementation of the Association Agreement, the reform on circular economy is still not realized and sustainable economy for consumers represents one of the factors that hampers the Europeanisation of Moldova.

So that, it is essential not only develop relevant laws, but also to keep abreast of their implementation. It is also important that all actions should be implemented in a coordinated and continues manner to ensure that all of them correspond to the existing needs of the day. All these recommendations emerge from the legal challenges faced by companies in the activity related to sustainable development.

In general, many challenges related to the implementation of green business relate to the production processes, price and fiscal regimes fluctuations, data and knowledge management, etc. (Mojarad, Atashbari and Tantau 2018), therefore governments, as well as companies try to find and apply different initiatives to better face environmental issues.

In this context, some UN member states, which approved the 2030 Agenda on SDG, have adopted and are in the process of implementation of several incentives on environmental impact of production processes. For instance, several industrial countries in Europe have adopted environmental legislation referred to charging manufactures with the responsibility for reverse logistics flows including used products and manufacturing-induced wastes (Karagülle, 2012). At the same time, in March 2022 the Moldavan Parliament approved the amendments to the Law on the protection of the environment and the Law on the protection of the atmospheric air, in context of the SDGs. The amendments regulate aspects regarding the establishment and training sources of the National Environment Fund, general aspects regarding the financing of programs and projects in the field of environment. The funds of the Fund will be used to finance programs and projects in the field of environmental protection, climate change and sustainable management of natural resources (Law of the Republic of Moldova no. 29 of 10-02-2022 for the modification of some normative acts).

However, there are still many countries with economic or political issues, which are far away from achieving tangible results towards environmental challenges and/or implementation of any measures in this respect, as may be the case of Africa, the Middle East and Latin America. Despite any initiatives, the states could lose markets or support the worsening terms of trade under the green economy. That is why the efforts of governments should rely first on assets and

capacities their country poses. For instance, the countries which have their economy based mainly on extractives, all support should be directed to improving the process of existing activities and diversifying of these activities.

When speaking about challenges, it is essential to underline that some social norms and legislation could promote unsustainable or discriminatory behavior and choices. For instance, the disproportionate burden of care work on women. This aspect shows that in many cases behavior is extremely integrated in culture and depend on power hierarchies and influence that determine individual choices as well as collective action (Independent Group of Scientists appointed by the Secretary-General, 2019).

However, there are several opportunities for changing behaviors and expanding space for collective action. The legislation is in fact the one which demonstrates at which level the society places on certain behaviors. The individual decisions are determined in many cases by the public information or advertising which influence beliefs change of norms (Independent Group of Scientists appointed by the Secretary-General, 2019, p. 36). All these aspects, which may seem insignificant to the entrepreneurial activity, have an important impact on the activity of enterprises and, consequently, must be taken into consideration when developing new policies and the legal framework.

A challenging example which shall be underlined by this paper, is the waste of electrical and electronic equipment by businesses, which is extremely pollutant and harmful for people's health and environment, if it is not managed properly. This challenge led to the amendment of legislations worldwide, considering that it could entail economical potential, with a great source of income based on recycling (Santos and Jacobi, 2022).

Another challenge faced by companies which have the initiative to adapt to SDGs is the lack or insufficient research and innovation capacities. For instance, in the case of the Republic of Moldova, the National Development Strategy "Moldova 2020", approved in 2012 (Government of the Republic of Moldova, (2012), stated that the paradigm of economic development during the implementation of the Strategy will involve attracting investment, developing exporting industries, promoting the knowledge-based society, including strengthening research activities and development, innovation and technology transfer geared towards efficiency and competitiveness. However, despite this desideratum, the reality of recent years demonstrates an insufficiently and fragmentally funded research and innovation system, far from being considered strategic and relevant for the real sector of the economy.

The Republic of Moldova is the first country in the Eastern Partnership which obtained the status of associated state in the Seventh Framework Program of the European Union for research, technological development, and demonstration activities (2007-2013) and, subsequently, in the Framework Program of the European Union for research and innovation "Horizon 2020"

(2014-2020). This status provided expanded opportunities for accessibility to European research projects for legal entities in the country. However, the lack of national investments in developing research and innovation capacities of the organizations to access on an equal basis with those in the European space in transnational projects and initiatives (including the lack of co-financing so far), but also rigid national laws providing for difficult procedures that endangered the management of the obtained projects, diminished the impact of this important result on the evolution of the national research and innovation system (Government of the Republic of Moldova, 2019, p. 1). For instance, the expenditures for research and innovation in the Republic of Moldova per capita amount to approximately 6.6 euros, 80 times less than the European Union average (Government of the Republic of Moldova, 2019, p. 2). In these funding conditions, it is difficult to conceive a trajectory of accelerated development of the field and of rallying to the European target objectives for financing research and innovation.

Another legal challenge faced by companies in the process of international trade are high tariffs for environmental goods, including those for climate change mitigation. This is an important issue that hinder, in fact, the economic growth and finding optimal solutions for climate change. Even though many countries decreased such tariffs, tariffs-based trade barriers still exist in other countries for environmental goods, which obviously influence directly the costs (Prag, 2017).

One of the most usual impediment faced by private sector in the context of sustainable goals is the lack of funding opportunities, which could be solved through digitalization and online platforms. Digital platforms and other developed IT technologies could lead to a rapid development of the business or, on the contrary, can cause the decline of the company if not integrated in time. Although two and a half decades ago the technology was not used for commercial application, in recent years, almost every field uses one or more of these technologies (Barbulescu *et al.*, 2021).

An important challenge which shall be addressed is the adoption of industrial policies and legislation by many countries, especially with the purpose to overcome the financial crisis. This kind of policies directly support emissions-intensive investment, such as new subsidy arrangements favoring fossil fuels, misalignments with the low-carbon transition, which led to distortion of international markets. On another hand, many of these newly introduced policies may seem to be orientated to green economy through the stimulation or creation of domestic industries manufacturing low-carbon power generation equipment. However, as it is stressed by the doctrine, various analyses have highlighted that such policies could lead to increased prices for both domestic and international suppliers, with the overall effect of hindering uptake of low-carbon electricity-generating technologies (Prag, 2017).

It is just as important to underline that new trends in international trade are associated with risks to use environment for protectionist purposes and use of subsidies and technical standard. In this context, it would be necessary to change trade patterns for smooth transition to green economy (Ayunisari, 2011). In this context, 5 steps could be proposed to be followed by private companies in order to face sustainable development challenges. Notably:

1. Understand the SDGs, specifically to familiarize with and understand the SDGs, including the opportunities and responsibilities it entails.
2. Define priorities in the activity, following a needs assessment, as essential step for establish and concentrate on efforts.
3. Set the goals for a good performance, following the established priorities.
4. Integrate sustainability into the core business and fix the targets across functions is fundamental towards addressing the goals.
5. Report and communicate on the progress against the SDGs continuously in order to understand and meet the needs of stakeholders (SDG Compass. The guide for business action on the SDGs, 2015).

It could be stated that the interest for sustainable trade raised overtime and this results from several legislative initiatives both at national and international levels. Despite several incentives adopted by states and international institutions, still many barriers to trade in services remain in the form of domestic regulations, which regulate the low-carbon transition (Prag, 2017). In this context, new/improved relevant legislation is necessary to be adopted and/or revised. In addition, climate stabilization and sustainable development should be analyzed, and implemented in national and international policies and trade practices in integrated and holistic manner, as well as monitoring of implementation shall be carried out to ensure that the implementation process is continuous and correspond to the existing needs.

4. LEGAL PARTICULARITIES OF PRIVATE SECTOR'S ACTIVITY IN THE CONTEXT OF SDGs

Any entrepreneurial activity succeeds when it is governed by the general principle that it covers the needs of people. In this context, businesses need for long term and strong legislation, which would provide them the opportunity to activate in a manner that would permit innovative decisions, attract investments and business development, aspects that are regulated by the UN SDGs. (Pedersen, 2018). The key objectives of companies shall be sustainable development and long-term existence. Moreover, the entrepreneurial activity shall protect and develop the habitat where the staff and their families live (Karagülle, 2012) and invest more in human well-being. Green business entails the adaptation of all policies and practices that would improve the quality of life for customers and protect resources. Using renewable energy resources,

enhancing material recyclability, reducing toxic dispersion are all eco-efficient practices while doing green business. (Karagülle, 2012). On the other hand, any discrimination or stigmatization of certain groups shall be eliminated.

If we speak about public-private partnerships, then it should be noted that any risk should be allocated fairly and the public interests is not included in the private and corporate interests (Independent Group of Scientists appointed by the Secretary-General, 2019).

Furthermore, the relevant legislation and practices referring to all stages of business processes: exploration and development, production process, storage, transportation, refining, and distribution shall be revised accordingly to ensure that the entirely business process is environmentally friendly. In addition, the following aspects as transparency, sustainable leadership, controlling of risks, awareness raising campaign, collaboration with costumers, etc. should be integrated in the entrepreneur's activity.

On the other hand, the companies' activity shall be governed by regulations which would help them identify, acquire, and assimilate the specific technologies for their activity/production. In this context, businesses should have possibility at national and regional level to test and certify goods, although it would imply the need for the state to create laboratories, create links with foreign accreditation bodies and organize technical training, etc. In addition, it would be needed to develop standards like those required internationally, to provide for the possibility to private sector export successfully to demanding key markets and result in less local pollution, resource use and waste. It is, however, essential to consider that product energy performance standards, testing procedures and labelling requirements at international level may vary and create difficulties in international trade. In this context, harmonization of these standards would be required. (Ayunisari, 2011).

In respect to the productivity of businesses, the SDGs seems to be the best long term strategic market outlook ever put in front of business, although the real positive impact could be reached following a long, uncertain, and overwhelming process. Following the assumption that SDGs represent the best long term market guidance businesses ever had, many companies included SDGs in many ways in their activity, although it required doing things differently (Pedersen, 2018).

At the same time, the rules/patterns of trade shall be changed to ensure the transition to the green economy to create opportunities for potential growth in goods and services, although it would entail the risks to use environment for protectionist purposes, including the undue use of subsidies and technical standards, and limiting the policy space that developing countries must promote their own green economies. In this respect, it should be noted as well that any standards, regulations, and prohibitions based on production and processing methods, which are not necessarily protectionist, shall be developed in a way

which would protect domestic producers. Such standards may involve carbon footprint labels, or labels that display the amount of greenhouse gases a product emits over its life cycle (Ayunisari, 2011).

Every entrepreneurial activity in the context of sustainable development should have legal access to fiscal facilities and incentives. In this context, the doctrine argues that the green economy to be effective should be supported by lowering tariffs for certain goods and services, as wind turbines and efficient light bulbs, and services such as environmental engineering. It is, however, essential to categorize the goods and services as "environmental", to eliminate the tariffs of unrelated goods. In addition, national governments should analyze the possibility in providing allocation of funds to different economic agents. In this case, priority should be given to public sector infrastructure investments that are critical to the transition to the green economy. If referring to the international level, priority should be given to the poorest countries or those more affected by climate change (Ayunisari, 2011).

5. CONCLUSIONS AND RECOMENDATIONS

In conclusion, for effective and successful entrepreneurial activity, common trade guidelines and principles related to sustainable development are highly important measures to be taken towards integration of SDGs in international trade. Furthermore, the businesses should reflect and consider in their activity the purpose and strategy, as well as long term objectives towards the SDG's. In addition, for sustainable development success of business, the entrepreneurial activity should integrate the transparency, sustainable leadership, controlling of risks, awareness raising campaign, collaboration with costumers, etc.

Even though there could be several challenges in integrating SDGs in the activity of private sector, especially in those from undeveloped countries, this should not impede states to adopt policies and integrate green economy concept in national legal frameworks and practices, as well as to support businesses with several incentives for including sustainable development in their activity. In each case all challenges and risks should be identified, and solutions provided. In this context, the following conclusions and recommendations are provided:

- new/improved relevant legislation is necessary to be adopted and or revised. In addition, climate stabilization and sustainable development should be analyzed, and implemented in national and international policies and trade practices in integrated and holistic manner, as well as monitoring of implementation shall be carried out to ensure that the implementation process is continuous and correspond to the existing needs;
- common trade guidelines and principles related to sustainable development are highly important measures towards integration of SDGs in international trade;

- the businesses should reflect and consider in their activity the business purpose and strategy, as well as long term objectives towards the SDG's. In addition, for sustainable development success of business, the entrepreneurial activity should integrate the transparency, sustainable leadership, controlling of risks, awareness raising campaign, collaboration with costumers, etc.

We can resume that entrepreneurial activity, including its services, products, resources and manufactures should embrace and adapt sustainable goals through practices which would benefit not only the planet, by eliminating pollution and preserving natural resources, but also will help people by eliminating poverty, increase of employment, good health and wellbeing. Despite any existing legal or any other challenges, businesses have several opportunities to adapt or develop their activity in a sustainable one, following a detailed analysis of existing opportunities and legislation, as well as establishment of the strategy and objectives to be achieved.

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MOTIVATIONAL FACTORS ENCOURAGING GIRLS AGED 6-12 TO PURSUE PHYSICAL ACTIVITY

TAL ALONI ROZEN

*Alexandru Ioan Cuza University of Iași
Iași, Romania
talsaloni@gmail.com*

Abstract

This paper aims to better understand the reasons that prevent girls from engaging in sport by focusing on the research question: "What motivational factors affect the physical activity frequency of Israeli girls and female adolescents aged 6-12?" The research instrument is a semi-structured interview, designed to examine factors that may motivate Israeli girls and young female adolescents to be more physically active. The interviews have been conducted between July 2021-March 2022. The research participants are varied from girls involved in competitive sports, parents of competitive girls, women who have formerly been active players and decision-makers, both in academia and management sports positions. Three main themes in the category of motivation have been obtained from the interviews: 1. The parents as a role model, the parents' encouragement, the parents' funding of the sports activity; 2. The Built-in / affirmative action for women's sports - religious, cultural, and traditional - the attitude towards women's involved in sports; and 3. The exposure to sports at young age. This paper may contribute to the identification of the motivational factors that affect the frequency of physical activity of Israeli girls and female adolescents aged 6-12. Moreover, it suggests further research of possible efforts exerted to encourage girls (aged 6-12) to be more engaged in physical activity.

Keywords: *physical activity; frequency of physical activity; behavioral change; Athena project in Israel; motivational factors.*

JEL Classification: I20, Z28

1. INTRODUCTION

This paper aims to obtain a better understanding of the reasons that prevent girls from participating in sport activities, by focusing on the research question: "What motivational factors affect the physical activity frequency of Israeli girls and female adolescents aged 6-12?"

The overarching aim is to present possible meaningful implications for Israel's future as an egalitarian, ambitious, productive, and healthy society both nationally and internationally. Thus, by examining the possible impact of marketing and advertising (through the Athena Project as a case study) on the elimination of barriers, as well as promoting sport activity of female adolescents, girls, and women in Israeli society. Studies conducted worldwide have indicated that a society that is more egalitarian in many areas, has a higher gross national

product. That is, knowledge of this field may lead to a more egalitarian society and, thus, to a more productive society in Israel.

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. It is supervised by the supervision of the Israeli Ministry of Culture and Sport under 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, as to the promotion and development of women's sports in Israel.

Athena offers opportunities in sports for girls, adolescents, and women 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 works 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 have been at a disadvantage in terms of their number, status and social standing in Israel and 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 this need improvement, if gender equality is to be achieved. Engaging in sports is a social, ethical, and educational instrument, which impacts all circles, beginning with the individual, through to the community and, finally, to society at large, making them all more egalitarian and more just - when women become equal partners in the sporting arena.

Despite the Athena project in Israel in the last decade, the marketing activity, and the awareness and sympathy for the Athena brand, there was no considerable change in the number of Israeli girls and female adolescents who engaged in sports. Their percentage has never exceeded the 22% line, 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 essentially 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 as to how to work for a more equitable society also in the field of sports.

Research Aim is to identify the motivational factors that affect the frequency of physical activity of girls aged 6-12, while the research question in our study is what motivational factors affect the frequency of physical activity of girls aged 6-12.

3. LITERATURE REVIEW

3.1. Regular exercising and gender differences

Regular exercising has prominent benefits for the promotion of adolescents' health. Exercising strengthens the body and improves physical health, such as: reducing fat, enhances metabolic processes and bone density. Physical activity contributes to the promotion of mental health, e.g., reducing depression and anxiety symptoms, as well as and increasing self-esteem, quality of spousal and familial relationship, improving cognitive and academic achievement (Hallal *et al.*, 2006).

Studies showed that greater gender equality and greater opportunities for women increased corporate profitability (Desvaux, Devillard and Sancier-Sultan, 2010); improved team intelligence (Woolley *et al.*, 2010); raised the scientific impact of intellectual collaborations (Joshi *et al.*, 2015); enhanced the economic growth of entire countries (Inglehart, Norris and Ronald, 2003). Studies of competitive sports conducted in Israel, elucidated gender differences for the benefit of men (Lissitsa, Galily and Chachashvili-Bololotin, 2010). Gender differences are intensified when one looks at media coverage, i.e., no women in the news and articles. Moreover, women are not appointed as management members of sports associations (Lissitsa, Galily and Chachashvili-Bololotin, 2010). All these reinforce social perceptions that define sports as a male issue (Seigelshifer, 2012).

The results of a study, conducted by Lissitsa, Galily and Chachashvili-Bololotin (2010), show that engaging in competitive sports works differently on boys' education than on that of girls. While girls involved in competitive sports manifested the highest educational attainments, boys engaged in competitive sports demonstrated the lowest attainments. This may be due to the socio-cultural context of youth in Israel, and the legitimacy granted to boys versus girls to engage in competitive sports (Lissitsa, Galily and Chachashvili-Bololotin, 2010).

3.2. The contribution of motivation to sports

The theory of self-determination (Deci and Ryan, 1985) presents three needs the satisfaction of which affects people's motivational state: a. ability - the need of individuals to demonstrate their ability; b. autonomy - the individuals'

need for autonomy; and c. belonging - the need of individuals to feel that they belong to a place or a group. According to this theory, students' behavior will be found on a continuum that, on the one hand, indicates lack of motivation, and on the other hand indicates internal motivation, as well as different levels of external motivation along the continuum. Moreover, learners will be motivated to enjoy activities that they can choose by themselves, that they control, and when they feel connected and supported by key people, such as principal, teacher, parent and group members (Lima and Wang, 2007; Rosenkranz *et al.*, 2012). Based on this theory, studies were conducted, exploring the relationships between the satisfaction of learners' personal needs and motivation in physical education classes (Reeve and Hyungshim, 2006).

In the context of physical education, research findings have indicated that a variety of factors within schools have a positive or negative effect on participation in classes. For example: physical education teachers, the quality of the curriculum, and the students themselves (Jenkinson and Benson, 2010). Furthermore, studies have illustrated that the learners' level of motivation decreases with age (Gao and Newton, 2009). To foster motivation in physical education classes, one must be aware of the reasons why children and adolescents invest or do not invest in physical activity (Duda, 1996), and, accordingly, plan activities that will meet their needs (Vincent-Morin and Lafont, 2005). These researchers recommended creating diversity in the curriculum while taking into consideration the learners' different levels and being sensitive to the students' goals, beliefs, values, and level of interest in the different activities (Duda, 1996; Vincent-Morin and Lafont, 2005).

There are researchers who believe it is not enough to know the motives for the activity. It is also important to identify the difficulties involved in physical education classes and the barriers to participation in these classes. For example, Jenkinson and Benson (2010) examined the difficulties of physical education teachers. One hundred and fifteen physical education teachers responded to a questionnaire about the difficulties in physical education primary school classes. The findings showed that most of the difficulties stemmed from institutional aspects, such as budgetary constraints, limited resources, reduction in school hours, lack of professional development, a busy curriculum and shortage of facilities and equipment. Teachers mentioned a variety of other difficulties, e.g., the difficulty of motivating students with low self-confidence or lack of interest, inability to deliver a structured and safe lesson, lack of training, lack of knowledge, lack of talent or expertise in physical education. Moreover, Jenkinson and Benson (2010) maintained that 45% of students were influenced by their peers while choosing an activity, and 26% of students pointed out lack of interest in participating. Acknowledgment of these difficulties has implications for teaching physical education, building a curriculum, training

teachers, and creating a teaching environment that will encourage adolescents' participation in activities.

An important point of view regarding participation or non-participation in physical education classes at school is that of students (Couturier, Chepko and Coughlin, 2005). The curriculum is perceived as the most influential factor for participation in the activity, but it is not the only one. When students were asked for their opinion on the program, it became clear that most of them preferred choosing the activity by themselves. Furthermore, students noted that they were happy to choose peers for group activities and a larger variety of activities. Couturier, Chepko and Coughlin, (2005) found three main reasons for students' participation in the activity: love of physical activity and movement; love of competition in team sports; and acknowledgment of the health value of the activity. The three main reasons for unwillingness to participate in the activity were: the inconvenience of getting sweaty into the post-activity class, the oppressive need of bringing a change of clothes, as well as lack of time to shower and change clothes after class (Couturier, Chepko and Coughlin, 2005). Another study found that students who thought physical education classes were helpful, were more interested in the class and were more likely to use more effective learning strategies. Conversely, students who were not interested in classes, failed to identify these strategies (Gao and Newton, 2009). Hence, in order to make the students interested in the activity, teachers were therefore recommended planning more meaningful lessons.

A major part of understanding the adolescents' motivation to participate in physical education classes is related to the social aspect. The physical education teachers' should be able to affect and direct important social processes. For example: cultivating adequate communication; caring for others (Sansock, 2007); establishing a relationship out of enjoyment and belonging to a group; developing leadership; accepting others and embracing the different; accepting the 'self' as part of developing self-identity; encouraging independence and creativity; and more (Rubin and Raviv, 1999; Lonsdale *et al.*, 2009; Bryan and Solmon, 2012; Rosenkranz *et al.*, 2012; Barnes and Spray, 2013; Grimmering, 2013; Wallhead, Garn and Vidoni, 2013).

3.3. Influence of parents on adolescents' athletic motivation

Studies have found that there is a link between authoritative parenting style and adolescents' athletic satisfaction (Juntumaa, Keskivaara and Punamäki, 2005). Moreover, according to several researchers, parenting style that supports autonomy, increases self-defined motivations (Chew and Wang, 2010; Gagné, Ryan and Bargmann, 2010).

Parents' tangible support, especially in the form of money and time, is particularly meaningful (Baxter-Jones and Maffulli, 2003; Wuerth, Lee and Alfermann, 2004). Parents consider such tangible support as a necessary

requirement for ensuring youths' participation and progress in sports (Knight, Boden and Holt, 2005).

Recent studies have shown a direct link between the amount of money parents allocate to their children's sports and subsequent perceptions of stress reported by child-athletes (Côté, Turnnidge and Evans, 2014; Dunn *et al.*, 2016); their athletic enjoyment (Amado *et al.*, 2015; Babkes and Weiss, 1999); anxiety levels (Power and Woolger, 1994); Scanlan and Lewthwaite, 1986); and involvement in unsportsmanlike behaviors (Leo *et al.*, 2015).

4. METHODOLOGY

This article describes the results of the first part of the qualitative study. Qualitative research itself is part of a much larger research set-up from the research of doctoral studies. The study was conducted by semi-structured interviews, aiming to examine factors that could motivate Israeli girls and young female adolescents to engage more in physical activity.

The interviews took place between July 2021-March 2022, and included girls involved in competitive sports, parents of competitive girls, as well as women who were formerly active players and decision-makers, both in academia and sports management positions.

The data are initially based on studies of Athena, and studies conducted by the Israeli Ministry of Sports regarding the number of girls and female adolescents who have participated in sports activities. These are preliminary data that first and foremost helped in formulating the research question and research hypothesis.

The semi-structured interview is the most common type of interview. It is an interview that combines both the flexibility of the open interview and the structured interview framework.

Twelve interviewees, women and men, were carefully chosen for the series of interviews. All of them are connected to the world of sports in Israel and key figures in the Israeli national sports arena, whether currently active competitor athletes, past active competitors, or parents of current athletes. The questionnaire was administered as a semi-structured interview, involving several pre-determined questions. However, depending on the progress of the interview, the order of the questions was sometimes different, and sometimes additional follow-up questions were added as the interview progressed.

All interviews were transcribed, and the content analysis of the data collected from the semi-structured interviews, yielded two main themes and 12 related categories. This paper focuses on the first theme, the motivational factors.

All the participants signed informed consent forms for participating in the interview. Moreover, they received an explanation about the purpose of the research and the nature of the use of the interview contents.

5. FINDINGS

The findings gave rise to motivational factors themes and related categories.

- **Exposure**

“Give them exposure at least three times a week to any sports activity, but do not start adjusting them and debating the type of activity”. (Interviewee 1)

“I think really at this age the exposure is at home and at school because there are not many other frameworks”. (Interviewee 5)

- **Parents as a role model**

“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)

- **The attitude towards women in the field of sports**

“I think that, in general, women’s sports are in a very bad situation in Israel, it’s embarrassing. The girls know and understand that they are not being considered and neither does anyone who engages in women’s sports. I see referees coming to the game and, like, come on let’s move on, like it does not really interest them to be a referee in a game of women’s basketball”. (Interviewee 6)

- **Parents’ push**

“If anyone has made sure I continued in basketball and supported me at the level of intervening and nagging, it’s my dad. He was most interested after I had already entered the field”. (Interviewee 11)

- **Parents’ funding for sports activities**

“Only his parents fund his flights, he flies almost every month, If his parents could not afford it then he would not have had a chance to get where he is today”. (Interviewee 5)

- **The Built-in / affirmative action for women’s sports**

“There is no reason to have any activity that receives a budget from the state if it does not act at least in a real way for some gender equality and gender activity”. (Interviewee 9)

"And let’s make affirmative action that everywhere there will be more sports activities for girls and women”. (Interviewee 10)

- **Religion, culture and tradition**

“A large part of the society in the State of Israel is patriarchal in its origin, and it is difficult for girls to live in patriarchal homes. There are two million Arabs and two million ultra-Orthodox out of ten million citizens.

These 40% constitute a traditional society with very, very severe social restrictions, that have existed for many years. As far as results are concerned, it is impossible to promote sports achievements for girls who want to engage in very competitive sports”. (Interviewee 12)

6. DISCUSSIONS AND CONCLUSIONS

The findings showed that three main issues were obtained from the interviews, in the theme of motivational factors: (i) parents as a role model, parents' push, parents' funding for sports activities; (ii) the built-in affirmative action for women's sports, religion, culture and tradition, the treatment of women in sports; and (iii) exposure to sports at a young age.

These findings are in line with the literature about parents' involvement in their children's physical activity (Baxter-Jones and Maffulli, 2003; Wuerth, Lee and Alfermann, 2004; Wolfenden and Holt, 2005; Knight, Boden and Holt, 2010). This point in particular is reflected in the findings of interviewees such as interviewee number 5 who said that if it were not for the parents' funding, the player would not have had a chance to be placed where he is today. Interviewee number 9 also mentioned the essential support of the parents, especially her father who was her main supporter. Furthermore, the findings illustrate that the attitude towards women's sports suffers from discrimination in Israeli society, both in terms of budgetary and perceptual allocations. Israeli society holds the view that sport is an issue of men and there is a clear preference for men in sport activities (Couturier, Chepko and Coughlin, 2005; Sansock, 2007; Lissitsa, Galily and Chachashvili-Bololotin, 2010; Siegleshifer, 2012). As interviewee number 9 pointed out, there is no reason to allow receiving a budget from the state for a sports activity intended for boys when at the same time in the same sports institution there is no similar activity intended for girls. Interviewee number 10 also reinforces this feeling by stating that in his opinion there are not enough options for sports activities for girls and women in the State of Israel. The findings also indicate that exposure to a variety of sports at a young age is a component of future motivation to engage in sports. (Duda, 1996; Vincent-Morin and Lafont, 2005; Coughlin, 2005; Couturier, Chepko and Sansock, 2007; Jenkinson and Benson, 2010). As the findings illustrate, the girls are not exposed enough to sports. So that in fact an important element in the motivation for sports is missing in the lives of girls in Israel.

Interviewee number 4 claims that in practice what brings the girls to the sports circles is either friends or parents, i.e., her words indicate that motivation to engage in sports depends to large extent on the degree of exposure of the environment close to them.

This is also confirmed by interviewee number five. In her opinion, the option for girls to be exposed to sports at a young age in Israel, is either at home or at school. This is due to the fact that there are no other suitable settings for girls. The findings show how critical exposure is at a young age, contributing to the girls' motivation to engage in sports in the future.

Despite the small scale of this qualitative study, the conclusion is that to promote the physical activity of 6-12 aged children, the parents should be involved. Moreover, it is necessary to generate a perceptual change in the

unequal attitude of the Israeli society towards girls' engagement in sports, compared to that of boys, as well as expose girls to sports branches at young age.

The themes and categories are the basis for the close-ended questionnaire that is about to be distributed these days to the research participants. By using quantitative analysis methods, I will try identifying possible relationships between the various variables and research hypotheses.

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BANK CONCENTRATION INDEX ANALYSIS AND ITS EFFECTS

ADELINA-ANDREEA SIRITEANU

*Alexandru Ioan Cuza University of Iași
Iași, Romania
siriteanuadelinaandreea@gmail.com*

ERIKA-MARIA DOACĂ

*Alexandru Ioan Cuza University of Iași
Iași, Romania
doaca.erika@yahoo.com*

ALIN VASILE STRĂCHINARU

*Alexandru Ioan Cuza University of Iași
Iași, Romania
alinstrachinaru@yahoo.com*

Abstract

In the current context, the states of the world are facing a high level of external debt. This paper aims to analyze the macroeconomic indicator, HHI, and its impact in relation to other macroeconomic indicators, considering the economic situation and the level of public debt in the Member States of the European Union.

The analysis period is represented by the period 2005 - 2019, a period of 15 years with an annual frequency. The purpose of this paper is to capture the influence of the macroeconomic indicator (HHI) on economic growth, with direct implications for the level of debt.

In this regard, we will use the VAR (Vector Autoregression Model). The results of the analysis show a causal relationship between this indicator and the indicators with a pronounced impact on public debt. There is also an inertia in both the evolution of the indicator in relation to the analysed indicators and the public debt, reflected by a more inversely proportional relationship.

Keywords: *economic growth; public debt; Vector Autoregression Model, HHI.*

JEL Classification: C33, E44, E60

1. INTRODUCTION

In the current economic context, we are all witnessing a growing instability in the capital market, and the banking system is experiencing some vulnerability both internally/domestically and internationally. In the end, this vulnerability is amplified on the one hand by the lack of stationary macroeconomic indicators under analysis (due to the economic situation in a continuous dynamic), and on

the other hand by the government and implicitly the political factors involved in decision making. All this has a direct impact on economic growth. And the states of the world must approach a harmonization of economic and budgetary policies that will lead to sustainable economic development. Finally, the purpose of these actions must be, *inter alia*, the stability of the accumulated debt and even its reduction.

The government's efforts can be interpreted as follows: on the one hand, the emphasis should be on the sustainability of fiscal and budgetary policies, because at the level of the European Union, the issue of public debt sustainability has become a matter of public interest, after the introduction of the single currency. On the other hand, by achieving a more balanced government budget (reduction of social spending) and by fiscal consolidation, because it has a strong impact in determining the debt-to-GDP ratio.

In this sense, specialized studies have shown that public debt has increased on average by approx. 86% in the three years since the main financial crises of the twentieth century, and in the case of the global financial crisis, which began in 2007, the public debt of the severely affected economies increased between 2007 and 2009 by 75%. Thus, the broad framework for the development of a country, a community, is determined by the decisions taken by the current and past governments. This framework is a major determinant of economic performance and flexibility and is "linked" to the political structure.

The aim is to analyze the index of banking concentration and its effects on economic growth, using the vector autoregressive model (Vector Autoregression Model) and describe the causal relationships between them. Also in this context, we wanted to highlight the contribution that the United Kingdom had in the whole mechanism.

The motivation of the chosen topic consists on the one hand in the paradoxical character that defines the banking system through all its components and implicitly the evaluation of the financial system, and on the other hand European Union. In other words, fiscal consolidation efforts have implications for all sectors of activity, including the banking sector - the banking concentration index.

2. LITERATURE REVIEW

In the literature there are various studies that support the link that is established between the bank concentration index and macroeconomic variables. Bourke (1989) and Molyneux and Thornton (1992) are among the first authors to evaluate bank profitability. The authors found that the profitability of this sector is not only influenced by internal factors, but also by external factors, the structure of the financial market and macroeconomic conditions.

According to a study (Athanasoglou, Delis and Staikouras, 2006) whose main purpose is the idea of examining the profitability behaviour of industry-

specific banks and not only, but also macroeconomic determinants in the period 1998-2002, it is observed, following research, that the results indicate the fact that, with the exception of liquidity, all bank-specific determinants significantly affect the bank's profitability in an anticipated manner with more or less direct implications on the level of public debt.

A key result is that the concentration effect is positive, which provides assumptions in support of structuring, even if there is some ambiguity given its inter-relationship with the structure-efficient hypothesis (banks with a high degree of efficiency increase the share, leading to an increase in bank concentration). However, a positive relationship between banking reform and profitability has not been identified.

Căpraru (2010) assessed the banking competition considering the evolution of the market share of the Herfindahl-Hirschman index (HHI), performance indicators such as ROA and ROE and the evolution of rates on deposits and loans. The results showed that competition in the Romanian banking system has been steadily increasing in recent years, and the main factors that influenced this process were: the privatization of most state-owned banks and the prospect of our country's accession to the European Union. In the evaluated period, there are two approaches: in the first period the banks performed very well due to their market share in a low competitive banking environment and after the privatization of some state-owned banks, the market leader lost market share in favour of another bank with higher performance.

Another author (Boermans, 2015) examines the concentration of the bond market among euro area investors. The focus is on long-term debt securities issued by euro area residents. To study the distribution of bond ownership, the Hirschman-Herfindahl Index (HHI) is calculated for each individual bond held by euro area residents. The results show that the level of market concentration is highest among sovereign bonds and bank debt securities, in addition, compared to other holding sectors, the European banking sector tends to invest in bonds that are characterized by the highest concentration of bonds. property. These findings have important ramifications for the analysis of financial stability and the understanding of financial market structures as a whole at EU level.

Several authors (Gavurova, Kocisova and Kotaskova, 2017) analyse the structure and performance of the European Union banking market between 2008 and 2015, in order to analyze the relationship between structure and performance. The structure of this banking market was measured by two main concentration indices: the Herfindahl-Hirschman Index (HHI) and the Concentration Rate for the Top 5 Banks (CR5). The results show a steady development of concentration by 2012 and a significant decrease in 2012. Since 2013, the level of concentration has increased, reaching an all-time high at the end of 2014, when the increase in market concentration primarily reflects a

decrease in the number of credit institutions. Performance was measured by profitability indicators: return on assets (ROA) and return on equity (ROE).

Since 2008, the development of this market has been affected by the financial crisis, which has led to a low profitability until the end of 2013. In recent years, the profitability of the European banking market has increased slightly. As a method, the authors used the Granger causality test for panel data. The results of the analysis show that in the studied conditions only the one-way relationship was approved, which goes from the performance of the banking sector to the concentration of the banking market.

The issue of debt, in terms of banking competition, with implications from country to country and implicitly of the effects on economic development, is addressed by Fungáčová, Shamshurb and Weilld (2017) who in their paper investigates its impact on the cost of credit in a trans-country setting. They use a group of firms from 20 European countries covering the period 2001–2011, taking into account a broad set of measures of banking competition, including two structural measures (Herfindahl-Hirschmana and CR5 index) and two non-structural indicators (Lerner index and H-statistics). The analysis shows that banking competition increases the cost of credit and that the positive influence of banking competition is stronger for smaller companies. The analysis is consistent with the information hypothesis that lack of competition stimulates banks to invest in software information and, on the contrary, increased competition increases the cost of credit. However, this positive impact of banking competition is influenced by the institutional and economic framework, as well as by the existing economic crisis / crises.

Other authors (Bakkar and Nyola, 2021) use a trans-European data set on the internationalization of banks. The paper considers organizations and geographical complexity and assesses its impact on systemic risk and how both the global financial crisis of 2008-2009 and the European sovereign debt crisis of 2010-2011 could have modified such an impact.

Prior to the crisis (2005-2007), the results suggest that the complexity of banks in practice significantly reduces systemic risk and increases stability, as it encourages banks to take more diversified risks. While such a relationship is reversed during the crisis (2008-2011) and after the crisis (2012-2013), in the idea that in times of crisis, international banks have less capacity to monitor cross-border risks. The results show that, regardless of the period, the effect of systemic risk complexity is exacerbated for “too big-too-bankrupt” banks and banks with a wide variety of activity. In contrast, complex banks with a history of mergers and acquisitions and banks operating foreign branch networks mitigate systemic risk during the acute crisis and in the post-crisis period

Jahangard and Abdolshah (2017) analysed the effects of macroeconomic variables on bank stability, using data from 17 banks. Thus, the effect of macroeconomic variables (interest rate, inflation rate, GDP growth rate) on bank

stability was measured. The results of the study showed that inflation has a significant negative effect on bank stability. The results show that it has a significant and positive impact on stability, but the effect of GDP growth is significant and negative, due to the negative correlation between the GDP growth rate and bank profits. the effect of the Herfindal-Hirshman Index (as a bank concentration index), the result being positive, but not a significant one.

Petria, Căpraru and Ihnatov (2015) analysed the main determinants of the profitability of banks in the EU27 in the period 2004-2011. The resulting empirical findings are in line with expectations, so that credit and liquidity risk, management efficiency, business diversification, market concentration, competition and growth have an influence on banks' concentration and profitability.

There is other important study that addressed this topic, Molyneux and Thornton (1992), which analysed the profitability of banks in 18 European countries between 1986 and 1989. The authors found that there is an association between return on equity, interest rates, concentration of banks and government.

Also, Athanasoglou, Brissimis and Delis (2005) conducted a study for the period 1998-2002, analysing the countries of Southeast Europe and finding that bank concentration is positively correlated with the profitability of banks and that inflation has a strong impact on the profitability of banks. Ciobanu and Pascaru (2018) empirically assessed the impact of macroeconomic factors on banking performance in 13 Central and Eastern European countries between 2000 and 2015. The authors measured the bank concentration using the Herfindahl-Hirschman index, which is considered the most significant in this respect, as it considers the share of each bank and gives a significant weight to high-capitalized credit institutions. The authors found that financial profitability is influenced by both external and internal factors.

However, recent literature has also written about several alternative indicators that measure the degree of concentration in the banking system. Thus, among the best known are the Rosse-Panzar and Lerner indices, which are considered a non-structural measure of bank concentration.

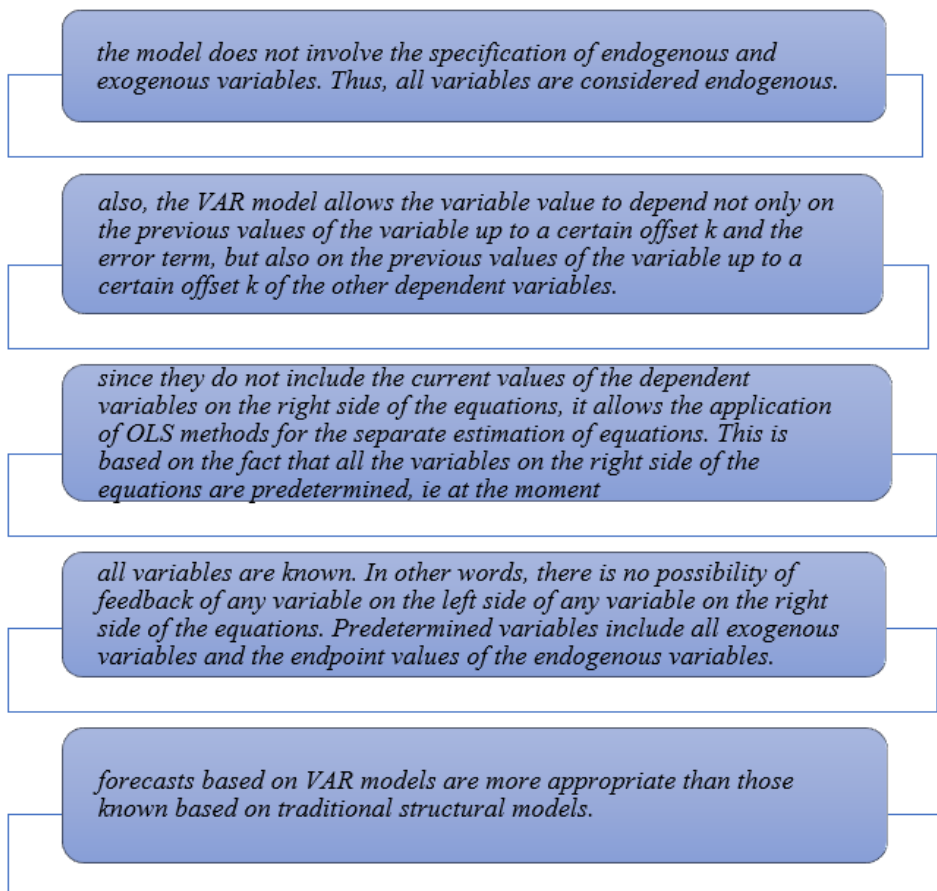
3. METODOLOGY

The methodological framework involves the use of an autoregressive regression model (Vector Autoregression Model-V.A.R.). We will use the VAR model as it evaluates the effects induced by various shocks on the variables in the system. Thus, each variable is affected by its own innovations, as well as by innovations in the other variables. This model also allows the decomposition of the variation of the prediction error, as well as the identification, in the Granger sense, of the causal relations. Thus, through the VAR model we will be able to analyse the effects of random shocks on system variables. The other regressors of the equation represent the explained and expected evolution of the variable,

modelled according to the other variables in the system, as well as its past values. For each equation in the system, the least squares technique is used to estimate the coefficients.

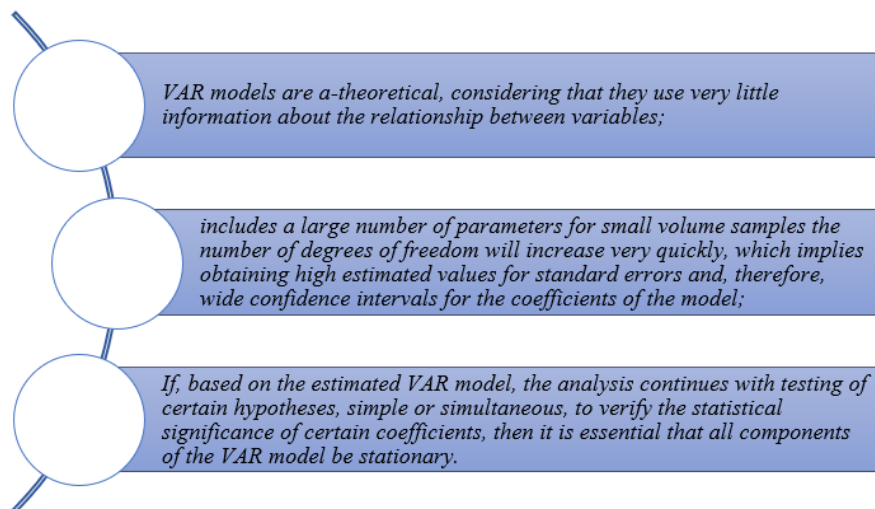
Within Figure 1, we presented the reasons why we used the VAR model in this paper.

Figure 1. Reasons for using the VAR model



Source: own processing

However, this model has some limitations, which we presented in Figure 2.

Figure 2. Limits of VAR modelling

Source: own processing

Within Table 1 we made a presentation of the variables used in this study.

Table 1. Description of variables included in the study

Variable name	Variable symbol	Description	Unit
Bank concentration index	HHI	Herfindhal Hirschman Index	
Government public debt	Public_Debt	General government gross debt	% of GDP
Current account balance	Balance_CA	Current account balance	% of GDP
Real exchange rate	Exchange_rate	Real effective exchange rate	3 year % change
Export market share	Export_quota	Export market share	% world exports
Nominal unit cost of labor	Labor_force	Nominal unit labour cost index	change % 3 years
Unemployment rate	Unemployment_rate	Unemployment rate	%

Source: own processing

The data used have an annual frequency for the period 2005-2019 and include a sample of 28 EU member states: Austria, Belgium, Bulgaria, Czech Republic, Cyprus, Croatia, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands,

Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Hungary, Great Britain.

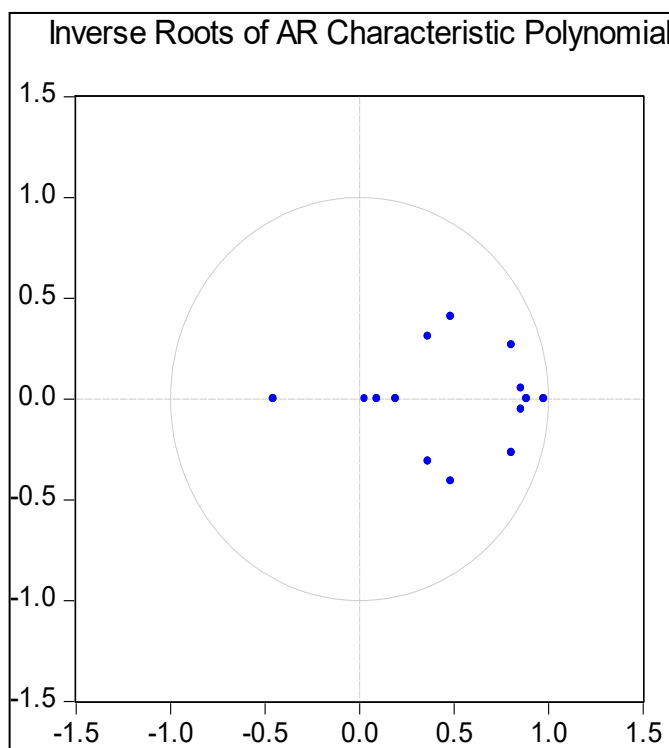
The sample was limited to this number according to the availability of data collected from the Eurostat, National Institute of Statistics and National Bureau of Economic Research database.

4. RESULTS

To establish the optimal number of lags for the model, we used the following informational criteria: LR: sequential modified LR statistical test (each test at 5% level), FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion. In this regard, we identified "2" as the optimal number of lags.

In Figure 3, we presented the roots of the polynomial.

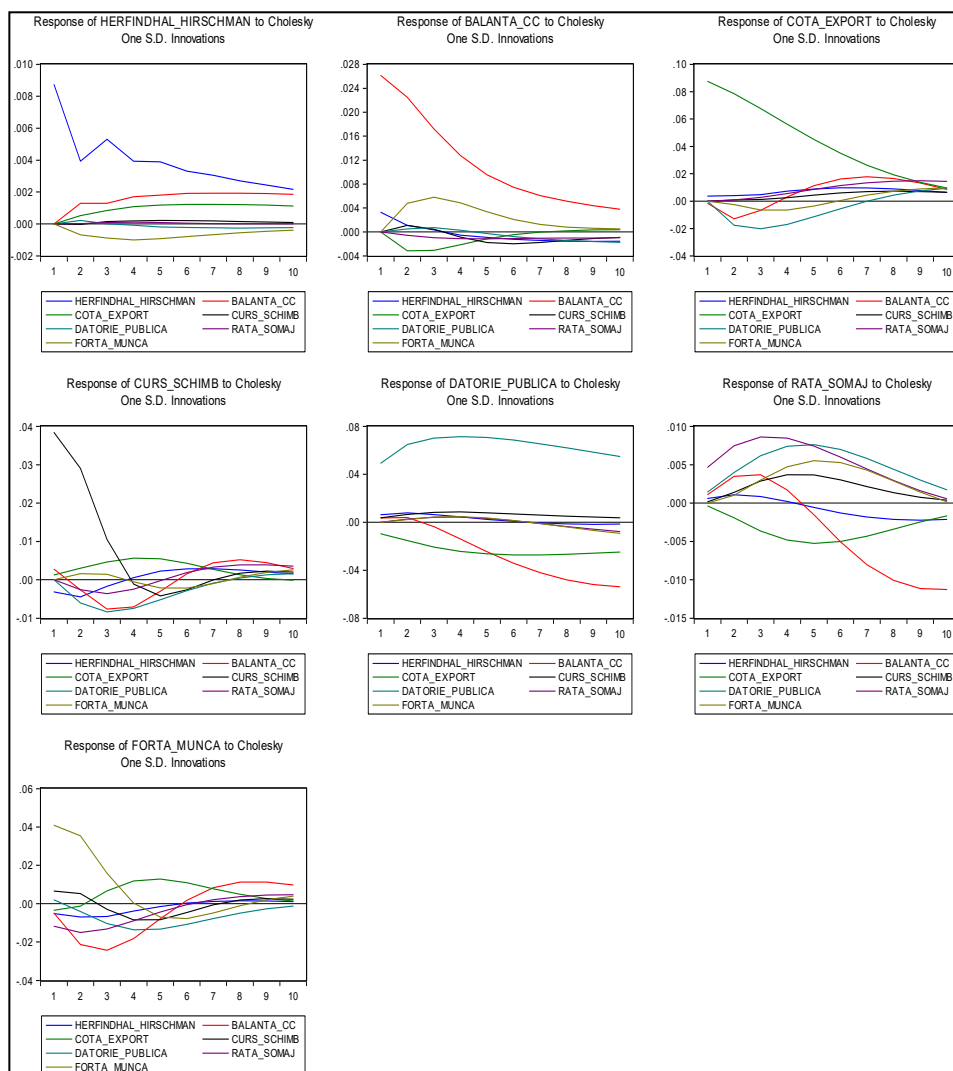
Figure 3. The roots of the polynomial



Source: own calculations

The roots of the polynomial are subunit, so the model is valid. In Figure 4, we presented what is the influence of the indicators.

Figure 4. Description of the influences of the indicators



Source: own calculations using EViews 8 software

4.1. Highlighting the influence of HH (focusing on the index)

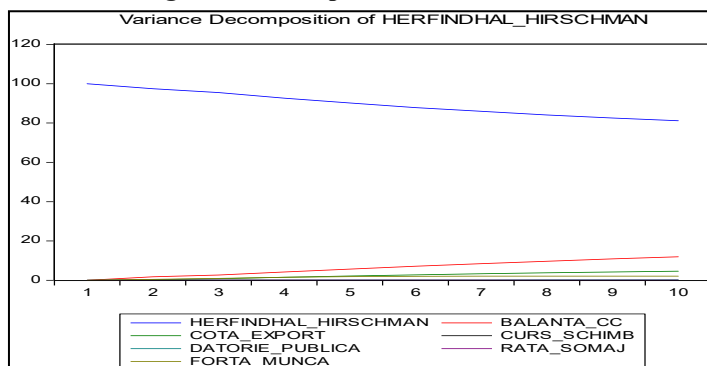
Description of the equation (R-squared = 0.851492):

$$\begin{aligned} \text{HHI} = & 0.013754 + 0.419654 \cdot \text{HHI}(-1) + 0.403796 \cdot \text{HH}(-2) + \\ & 0.403797 \cdot \text{BALANTA_CC}(-1) + 0.005859 \cdot \text{COTA_EXPORT}(-1) - \\ & 0.016669 \cdot \text{FORTA_MUNCA}(-1) \end{aligned}$$

Next, we used the variation of the variation to indicate the relative importance of external shocks in explaining the evolution of the dependent variable over a period of 10 years (Figure 5).

The OX axis is the temporal axis, while the OY axis represents the percentage of the variation of the index explained by each variable, and for each period the sum of the percentages is 100%.

Figure 5. Decomposition of variance



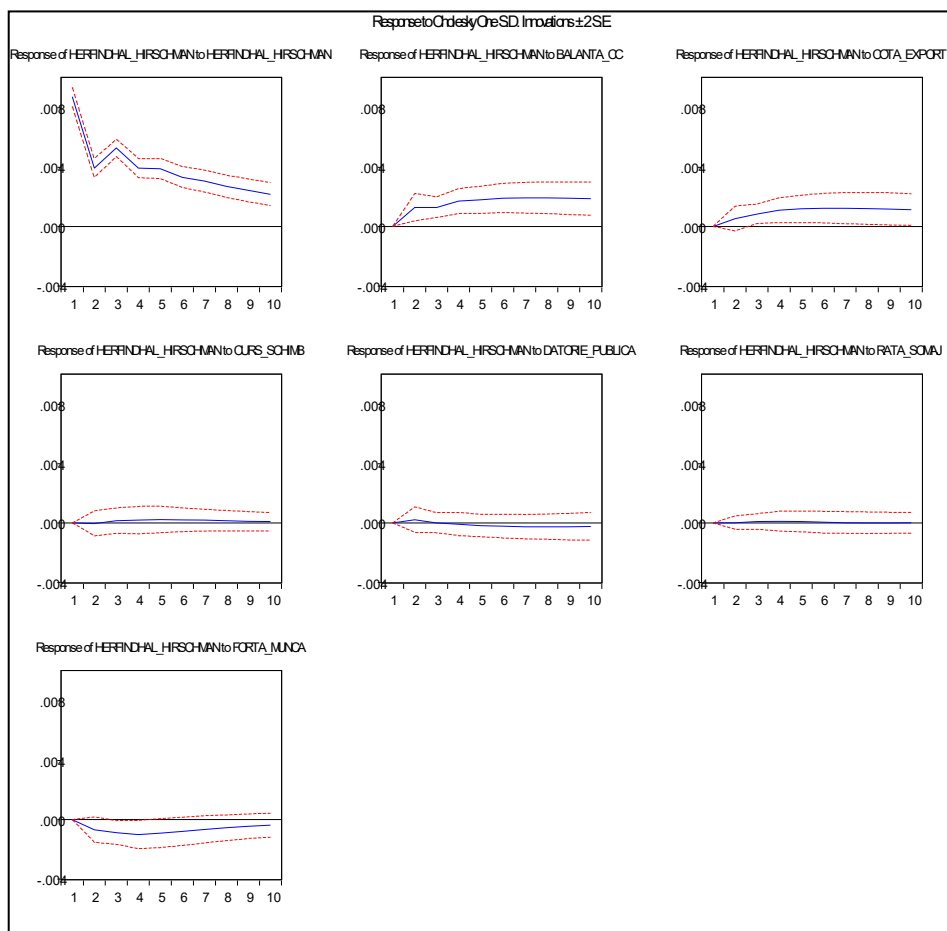
Source: own calculations using EViews 8 software

The impulse-response function tracks the reaction of the dependent variable to an unexpected shock at the level of the explanatory variables. Basically, the reaction of HH market concentration to a one-unit shock is tested at the standard errors of each variable in the system, in this case, of the listed indicators. Thus, in Figure 6 we presented the structure of the impulse response functions.

The solid line represents the estimated response, while the dotted lines mark the confidence interval equal to ± 2 standard errors. At a shock of one unit on the errors of the explanatory variable we observe the behaviour of public debt, respectively of the economic growth during a period of 10 years.

At a one-unit increase in each indicator, the reaction of HHI is observed in a direct and inversely proportional manner as follows:

- directly proportional to the indicators: Current account balance, Real exchange rate, Export market share and Unemployment rate;
- inversely proportional to the indicators: Nominal unit labour cost, Government public debt.

Figure 6. The impulse-response function

Regarding the analysis of the Herfindahl-Hirschman index in relation to the analysed indicators we can state the following:

- HHI's reaction to a change in the current account balance can be observed starting with the first period. Its effect is increasing from the first period, followed by a decrease until the second, even the third period, and after that - the evolution is increasing until a new period;
- HHI's reaction to a change in export market share can be observed from the first period. Its effect is increasing from the first period to the eighth period;
- HHI's reaction to a change in the exchange rate can be observed starting with the second period. Its effect is more linear, followed by an increase and decrease between the fourth and sixth period;

- HHI's reaction to a change in public debt can be observed from the first period. Its effect is slightly increasing from the first period, followed by a linear trend, and from the fourth period - a decrease to the tenth period;
- HHI's reaction to a change in the unemployment rate can be observed starting with the second period. Its effect is more, one linear to the tenth period;
- HHI's reaction to a change in the nominal unit cost of labour can be observed from the first period. Its effect is decreasing from the first period to the fourth period, and after that - the evolution is slightly increasing until a new period, following that until the tenth the trend is a linear one.

We believe that a detailed analysis of these indicators demonstrates once again that everyone has their own contribution to the evolution / level of public debt; the fact that stationarity is an essential aspect that brings quality but also the method used / econometric calculations, interpretations and results obtained helps or should help economic environment and political factors in developing strategies for making the best decisions in the medium and long term that aimed at the sustainable economic development of any Member State of the European Union.

6. CONCLUSIONS

Achieving the main objective involves analysing factors of influence, with a pronounced impact in order to estimate and predict the occurrence of systemic risks and in this sense, we can say that international economic relations take place in such a complex environment where uncertainty and risk are conditions, which generates a multitude of possibilities and options.

Following the study, we found that an increase of one unit of each indicator shows the reaction of HHI in direct proportion to the indicators: Current account balance, Real exchange rate, Export market share and Unemployment rate; and inversely proportional to the indicators: Nominal unit labour cost, Government public debt.

And in the case of the analysis of the Herfindahl-Hirschman index in relation to the analysed indicators, we found that the reaction of HHI to a change in the current account balance and market share is mainly increasing. HHI's reaction to a change in the exchange rate is also more linear. And HHI's response to a change in nominal unit labour costs is predominantly declining, followed by the stabilization phase.

As a future direction of research, we aim to empirically analyze other macroeconomic indicators that are influenced by the HHI index. We also consider that it would be interesting to include in the analysis the candidate and potential candidate countries for the European Union.

Unfortunately, the analysis is also subject to some shortcomings due to the unavailability and stationary nature of the data, and the analysis period fails to capture all those developments that can help us make the best decisions, but certainly this whole period (2005 - 2019), subject to analysis shows that the fluctuation of indicators is in a continuous dynamic and only the elaboration of strategies with a strong impact on the economy of the member countries can lead to a sustainable economic development in the medium and long term.

In conclusion, the results of the study show that the banking concentration index is influenced by macroeconomic variables.

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VIOLATIONS OF THE RIGHTS OF EUROPEAN CITIZENS IN THE ACTIVITY OF JUDICIAL BODIES. ECHR RECENT INSIGHT

ANGELA TATU

“1 Decembrie 1918” University of Alba Iulia

Alba Iulia, Romania

tatuangela@yahoo.com

Abstract

Knowing the provisions of the Charter of Fundamental Rights of the European Union also means knowing the rights of European citizens. These rights include: the legality of the criminalization of crimes and punishments, the right to a fair trial and the right to an effective appeal, the presumption of innocence, the right to defense, the proportionality of punishments in criminal matters in relation to the crimes committed, the right not to be tried or convicted a second time for the same act - ne bis in idem. In addition, we must also know the cases in which these rights can be violated, in order to signal possible abuses by various institutions against European citizens. Only by invoking them through the procedural means left at our disposal, of every European citizen, can we on the one hand defend ourselves, and on the other hand all those who are the authors of these abuses be sanctioned. This article aims, in addition to the previously revealed aspects, to show the reader concrete situations in which the main rights recognized to European citizens were violated by the judicial bodies in the activity of criminal prosecution or trial, by showing concrete examples of violations and the way to repair the damages caused. The goal is, beyond pointing them out, to teach future law practitioners not to "fall into the same sin", also violating the international provisions that enshrine these rights. ECHR practice was taken into account.

Keywords: *European citizens' rights; violations; ECHR; The Charter of Fundamental Rights of the European Union.*

JEL Classification: K31

1. INTRODUCTION

It is important for each of us, as European citizens, to know those rights that are recognized in our favor, each of us, through the Charter of Fundamental Rights of the European Union (2012), in the context in which the acquisition of European citizenship presupposes the assumption of certain rights and the fulfillment of certain obligations. correlative.

This article aims to show the reader concrete situations in which the main rights recognized to European citizens have been violated by the judiciary in criminal prosecution or trial, by showing concrete examples of violations and how to repair damage caused. The aim is, in addition to signaling them, to teach

future practitioners of the law, not to "fall into the same sin", in violation of the international provisions that enshrine these rights.

This paper analyzes in part the rights of European citizens, selectively presents the cases in which they were violated by the judicial bodies, as well as the sanctions and remedies given to the citizens who suffered in such cases. The research points aim at the regulation of the rights conferred by the Charter, the violations of rights, and the practice of the ECHR with the adopted solutions. The work presents the concepts used in the legislation and specialized literature, with the description of each right and the ECHR practice in the matter.

The questions raised in our analysis are:

- Did you know that every European citizen has the right to a fair trial and the right to an effective remedy?
- Did you know that every European citizen enjoys the presumption of innocence and the right to defense?
- Did you know that in criminal matters the punishments and offenses that apply to criminals must be provided by law and that they must be proportionate to the act committed?
- Did you know that if you have already been convicted of a crime, you cannot be tried or convicted a second time for the same act?

We hope that all this will be known by every European citizen through this approach, so that in the field of justice we have as little ambiguity as possible. Every European citizen MUST be fully aware of his or her rights in the field of justice, both for himself or herself and for his or her family or those close to them.

2. METHODOLOGY

As the method used in the realization of this study, the theoretical information on the studied topic was used as the 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 respected the legal framework in the activity of administering justice and whether the European courts found violations of the provisions established by the European legislation; practically, if the rights of European citizens were 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. THE LEGAL RIGHTS PROVIDED BY THE CHARTER

3.1 The right to an effective remedy and to a fair trial

Any person whose rights and freedoms guaranteed by Union law are infringed shall have the right to an effective remedy before a court or tribunal in accordance with the conditions laid down in this Article. Everyone has the right to a fair and public hearing within a reasonable time before an independent and impartial tribunal established by law. Everyone has the opportunity to be advised, defended and represented. Free legal aid is provided to those who do not have sufficient resources, to the extent necessary to ensure effective access to justice. (Article 47 Charter/Article 6 ECHR)

The principle of the right to a fair trial is a principle enshrined in the law, respecting all the "fundamental guarantees of good justice", of a fair justice, so as to ensure the balance between the holders of legal actions and the persons exercised. Among these guarantees, we mention equality of arms, the right to know the criminal charge, the right to silence or the right not to incriminate oneself. Also, guarantees that ensure the right to a fair trial can be found in other texts of the Convention or of the Additional Protocols, respectively art. 7 of the Convention on the legality of sanctions under criminal law or art. 2 and art. 4 of Protocol no. 7 regarding the double degree of jurisdiction in criminal matters and not bis in idem. In addition to these rules, the Court pointed out that the provisions of art. 13 of the Convention on the Right to an Effective Remedy may be such as to require the recognition of safeguards in order to put an end to the violation of fundamental rights in the course of criminal proceedings.

The right to judge the case publicly and within a reasonable time refers to the settlement of cases "with open doors" and without undue delay (Theodoru and Chis, 2021). Any unjustified delay is incompatible with the right to a fair trial, regardless of the nature of the case. The publicity of the trial of the cases is ensured by the access of any person in the courtroom, the trial being a public phase, unlike the criminal investigation which is confidential and reserved only to the parties in the trial. Being allowed access to any person in the courtroom, every citizen can get in direct contact with what a trial entails, with its conduct, but also to know the punishment that applies to the offender, in this way he, the citizen, is no longer tempted to break the law. This ensures the educational purpose of the pronounced punishment, thus achieving general prevention.

Judging the case within a reasonable time, presupposes in criminal matters that the persons who are accused of committing a crime should not be for a long time under the rule of the accusation brought against them, the completion of the criminal process having to respect the principle of speed. In the *Stögmüller v. Austria* case, the Court added that the guarantee of a reasonable time "was regulated, in particular in criminal cases, in order to prevent a person from

remaining for a long time in a state of uncertainty as to his or her fate" (ECHR, Strasbourg, Application, no 1602/62).

In this way, there must be as little time as possible between the moment of committing the crime and the moment of pronouncing and executing a punishment, in order to respond to the needs of the society whose values were violated by committing the crime and which must be restored, but also to the criminals who will execute. as soon as possible the punishment and thus they will "pay" for the harm produced.

In the ECHR practice, in the Dimon against Romania case (no. 29117/05, Judgment of November 27, 2012), the violation of art. 6 §1 of the Convention, the plaintiff showing that his right of access to a court was violated, by canceling the appeal declared for procedural defects. The Court considered that since the actual content of the plaintiff's appeal was not taken into account, the Braşov Court of Appeal deprived the latter of access to a court, finding that Article 6 §1 of the Convention was violated.

In the case of Orasanu and others against Romania (no. 43629/13 and 74 other applications, Judgment of November 7, 2017), the ECtHR found a violation of art. 2 of the Convention under procedural aspect, establishing a fair satisfaction of EUR 15,000 each, as moral damage, for 52 claimants.

In fact, the violation of Article 2 of the Convention was invoked, due to the lack of an effective, impartial and in-depth criminal investigation, carried out within a reasonable period of time and which would allow the identification and punishment of the persons responsible for the violent repression of the demonstrations of December 1989 in Bucharest, Timisoara, Braşov, Reşita and Craiova, during which they were shot or their close relatives were killed by gunfire. The Court noted the existence of some procedural deficiencies in the main investigation, noting the excessive duration and long periods of inactivity, but also the non-involvement of the victims and their relatives in the process, as well as the lack of informing the public about the progress of the investigation.

The violation of art. 6 § 1 and art. 13 of the Convention, the applicants criticizing the excessively long duration of the criminal proceedings concerning the events of December 1989. They also complained that they had not had an effective remedy available to them in relation to the determination of the heads of claim brought by these. Considering the finding regarding art. 2, the Court considered that it is not necessary to examine the admissibility and substance of the claims based on art. 6 § 1 and/or art. 13 of the Convention.

In a more recent case, case M against The Netherlands (no. 2156/10, Judgment of 25 July 2017) the applicant complained about the unfair criminal procedure, as the General Intelligence and Security Service carried out a decisive control over the evidence, by restricting his access to them and controlling their use, being prevented from effectively training his lawyers. Checking, the Court showed that the information that remained readable was

sufficient for the defense and the Court of Appeal for a reliable assessment of the nature of the information in those documents. On the other hand, the Court finds that, by interfering with the communication between the applicant and his lawyers, the fairness of the trial was irreparably compromised.

The Court ruled that there was no violation of art. 6 § 1 and art. 6 § 3 lit. b of the Convention regarding the censorship of certain documents and the alleged refusal to present others, but art. 6 § 1 and art. 6 § 3 lit. c of the Convention for the restrictions applied to the plaintiff's right to give information and instructions to lawyers, granting a fair satisfaction of 732 euros, as court costs. Referring these decisions of the Court to the articles of the Convention, we agree with the pronounced solutions, as being legal and thorough.

3.2. Presumption of innocence and right of defense

Any accused person is presumed innocent until proved guilty according to law. Any accused person is guaranteed to respect the right to defense. The presumption of innocence presupposes that the mere accusation brought against a person who has committed a crime does not amount to establishing his guilt. (Article 48 Charter/Article 6 ECHR)

In order to establish the guilt of an accused person, the judicial bodies have the procedural obligation to gather evidence both in favor and against the accused in order to reach a certain conclusion of guilt. In the absence of certainty, whenever there is a doubt about a person's guilt, the rule in dubio pro reo applies, in the sense that the doubt benefits the accused, who must be acquitted and not convicted. Until the adoption of a final conviction in a case, the defendant has the status of an innocent person. After the adoption of a final conviction, the presumption of innocence is overturned with erga omnes effects, that is, towards everyone. The conviction must be based on certain evidence of guilt, and in case of doubt that cannot be removed by evidence, a solution of acquittal must be pronounced. Also, taking preventive measures (arresting a person or placing him under judicial control) can be done only in the cases strictly listed and under the conditions established by law, ensuring the exceptional nature of restricting the liberties of the individual until the full establishment of guilt (Tatu, 2016).

In ECHR practice, in the Telfner against Austria case, the 2001 decision no. 33501/96, the Court ruled that a conviction in the absence of convincing evidence of guilt is a violation of Article 6 paragraph 2 of the Convention. He also showed that requiring a person to prove his innocence is contrary to the presumption of innocence. In the case of Murray v. United Kingdom, it was considered that the silence of the accused cannot be interpreted as an admission of guilt. If the interpretation of the silence is in the sense of acknowledging the accusations, we can talk about the violation of the presumption of innocence.

Another violation of Article 6 paragraph 2 of the ECHR is a conviction based only on evidence obtained during the criminal investigation, without giving the defendant the opportunity to challenge the court's decision, being an interference with the defendant's right to be presumed innocent until proven guilty. of guilt. Also, the suspicions on the person in the preventive arrest procedure do not represent a formal finding of guilt and do not constitute a violation of the presumption of innocence. Consequently, the violation of art.6 cannot be invoked with the aim of not informing the public about the ongoing criminal investigations. At the stage of the preliminary criminal investigation, all measures that illegally establish guilt are inadmissible. However, the presumption of innocence does not exclude criminal investigation measures related to suspicion. Also, it is not excluded that the criminal investigation authorities treat the accused as a suspect.

According to EU Directive 2016/43 of the European Parliament and of the Council, research bodies cannot treat it the suspect as guilty before guilt is definitively established. When assessing the statements of suspected or accused persons or evidence obtained in violation of their right to remain silent or not to incriminate themselves, courts and judges should respect the right of defense and the fairness of the proceedings. In the case of Jean-Gustave Funke against France it was ruled that the obligation to submit certain documents to an authority may violate the presumption of innocence if it does not pursue a legitimate administrative goal, but only wants the person concerned to provide self-incriminating evidence necessary for the initiation of criminal proceedings,

As a "replication" of the formulation of an accusation against a person (Tatu, 2009), the right to defense is exercised in the criminal process, as a fundamental right that ensures a balance necessary to find out the truth in the criminal process. The right to defense implies the right to be assisted by a lawyer, elected or ex officio, and the right to defense includes, in addition to the "right to defense", the procedural rights that the suspect and the parties have to defend their legitimate interests, such as: the right to know the accusation/accusation brought against him, the right to know its legal framework and to ensure the possibility of preparing and exercising his defense.

Judicial bodies have the obligation to inform the suspect, even before being heard, of the accusation brought against him, which puts an end to "blind exploration" (Tulbure and Tatu, 2009) and situations when the suspect, not knowing the accusation, could incriminate himself. The suspect's right is enshrined before the first statement is taken to be informed about the right to be assisted by a defense attorney, this being recorded in the hearing report; In some situations provided by law, the suspect is automatically provided with a defense attorney, if he does not have a chosen defense attorney. Throughout the criminal process, the suspect has the right to formulate requests, complaints, memoranda, the right to propose defense evidence, the right to fight the accusation, the right

to participate in the execution of criminal investigation documents (searches) and all court documents; the right to make objections regarding the identity, the right to have the last word in the judgment, the right to exercise the means of appeal.

In ECHR practice, the *Magee v. Great Britain* judgment of June 6, 2000, showed that the use of testimonies given in the absence of legal assistance in criminal matter may affect the right to a fair trial. The Court found that the refusal to allow him the assistance of a lawyer for such a long period brought irremediable damage to the right to defense and is incompatible with the rights that art. 6 to a defendant.

By the judgment of 9 May 2017 in the *Poropat v. Slovenia* case (application no. 21668/12, the European Court of Human Rights The man found that art. was violated. 6 § 1 and 3 (d) of the Convention, being created an unfair advantage in favor of the prosecution, the applicant being deprived of any practical possibility to effectively challenge the charges against him.

3.3. Principles of legality and proportionality of offenses and penalties

No one shall be held guilty of any penal offense on account of any act or omission which did not constitute a penal offense, under national or international law, at the time when it was committed. Nor may a heavier penalty be imposed than the one that was applicable at the time the criminal offense was committed. If, after committing the crime, the law provides for a lighter punishment, the latter shall apply. This Article is without prejudice to the trial and punishment of a person who has been guilty of an act or omission which, at the time of the commission, was criminalized on the basis of general principles recognized by the Community of Nations. The penalties must not be disproportionate to the offense. (Article 49 Charter/ article 7 ECHR)

The principle of the legality of the criminalization of crimes constitutes a fundamental principle of criminal law, according to which only the facts provided for by the criminal law at the time of their commission constitute crimes and can be penalized. The legality of the offense requires that the offenses be described clearly and precisely (*nulum crimen sine lege certa*). Determining the facts that are crimes must be done by using a common and accessible language, so as to avoid the risk of extending the law by analogy and misunderstanding the rules of incrimination (*Kokkinakis case against Greece*, 1993). The application of the criminal law by analogy means an extension of the scope of the law to acts not foreseen by the law. That is why the criminal law must provide for the elements of each incriminated crime, i.e. it must be accessible, it must be predictable, i.e. it must present the incriminated facts with sufficient clarity, it must be predictable and clear (*Rotaru case against Romania*, 2000, and *Sissanis case against Romania*, 2007).

The principle of applying the more favorable law is also enshrined. If, after the commission of a crime, a law provides for a lighter punishment than the law applicable at the time of the commission of the crime, this law will be applied, which will be retroactive and will produce effects before its entry into force (the Scoppola case against Italy, 2009; the Maktouf case and Damjanović v. Bosnia-Herzegovina, 2013; the case of Gabarri Moreno v. Spain, 2003; the case of Jidic v. Romania, 2020).

Also, in the case of Dragotoiu and Militaru – Pidhorni against Romania (no. 77193/01 and no. 77196/03, 2007), the Court considered that the article on art. 7 of the Convention, awarding 3,000 euros to each claimant as compensation, showing that the domestic courts proceeded with an extensive application of the criminal law, considering that acts of bribery by employees of commercial companies with private capital constituted a criminal offense, although the Code the criminal law incriminates only the acts committed by employees of state or collective organizations, not private ones (Pessino case against France, 2006).

3.4. The right not to be tried or convicted twice for the same offense

No one may be tried or convicted of an offense for which he has already been acquitted or convicted within the Union by a final judgment in accordance with the law. (Article 50/article 4 Protocol 7 of the Convention)

Ne bis in idem - latin expression according to which a person, if he was initially tried by a final decision, later can not be tried again for the same deed. In order to operate this fundamental principle, there must be a final court decision and there must be an identity of facts and persons in the two cases.

The principle provides from ancient times, from the time when Emperor Justinian I's Digests wrote a collection of legal writings published in 533 A.D., which stated that "The governor must not allow the same person to be accused again of a crime for which has already been paid" (Udroiu, 2022). In the year 335, in the Discourse against Leptines' law, Demosthenes claimed that "the laws forbid the same person to be judged twice for the same issue" (Udroiu, 2022).

It has been emphasized in the doctrine that the ne bis in idem principle is not a form of cooperation in criminal matters, but a form of mutual recognition within the EU that serves, on the one hand, the interests of convicted or definitively acquitted persons, and, on the other. the interests of the State in which the final judgment was given (Tulbure and Tatu, 2003).

In the Zolotukhin case against the Russian Federation, 2009, The Court stated that Article 4 of Protocol no. 7 is not limited to the right not to be criminally punished twice, but also includes the right not to be prosecuted or tried twice. The Court reiterated that Article 4 of Protocol no. 7 applies even if the litigant was prosecuted in a proceeding that did not end in a conviction. Article 4 of Protocol no. 7 contains three distinct guarantees and states that for the same act no one should: risk being tried, be tried or be punished.

In other cases, the Court ruled more strongly (the Glantz case against Finland, 2014; the Nykänen case against Finland, 2014; and Lucky Dev against Sweden, 2014). In the Nykänen case, which established the principle adopted in other cases against Finland and Sweden, the Court established that there was a violation of Article 4 of Protocol no. 7 of the Convention because the applicant was convicted twice for the same matter in two separate sets of proceedings, applying criminal sanctions and administrative sanctions, by different authorities, without the proceedings being in any way connected. None of the sanctions ordered were taken into account by the other court or authority in determining the severity of the sanction, nor was there any other interaction between the competent authorities. The reasoning is identical in other cases (Rinas against Finland, 2015; Osterlund against Finland, 2015).

In Tomasovic case against Croatia, 2012, the applicant was tried and convicted twice for the same crime - possession of drugs, initially as a "misdemeanor" and then as a "felony". Since the second set of proceedings was not discontinued at the end of the first, the Court considered that there was a duplication of criminal proceedings. Similarly, in the case of Grande Stevens v. Italy, the Court found that there were dual proceedings in respect of the same fraudulent conduct – namely market manipulation by spreading false information: one set of administrative proceedings and some "criminal" proceedings.

In the cases of Kapetanios and others against Greece, and others and confirmed in Sismanidis and Sitaridis against Greece, 2016, the applicants were initially acquitted in the criminal proceedings concerning customs offences. The administrative courts subsequently imposed administrative fines on the applicants for the same conduct. Finding that the latter proceedings were of a "criminal" nature within the meaning of the prohibition set out in Article 4 of Protocol No. 7, the Court concluded that there had been a violation of that provision.

4. CONCLUSIONS

Through both the theoretical and practical presentation of the rights of European citizens, as well as their violations, we each learned to know our rights, but also to report to the bodies empowered by law their possible limitations. We must not remain passive, but instead have an active attitude. All this is possible through in-depth and sustained knowledge, in order not to leave room for mistakes as much as possible, and if they still exist, to be removed by legal means and with the compensation of those who suffered. All the examples presented are only a part of a multitude of other examples. This does not mean that in principle our rights, of each one, are not respected.

The purpose of the article is to make a pertinent analysis between the provisions of the Charter of Fundamental Rights of the European Union (and

Far from considering the problem addressed closed, we are entitled to hope for as few such violations as possible, and an argument in this sense is constituted by many other decisions pronounced in accordance with European legislation, that is, with the provisions of the Charter of Fundamental Rights of the European Union. The national judge has a decisive role in promoting respect for human rights, in any rule of law. The delimitation of powers gives it its own jurisdiction, but in order to have an efficient judicial system, national legislation must be harmonized with European law, and the decisions pronounced in accordance with European provisions will lead to as few restrictions and violations of the rights of European citizens as possible.

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PROCESS AUTOMATION IN PUBLIC SERVICES

DRAGOȘ-OVIDIU TOFAN

*Alexandru Ioan Cuza University of Iași
Iași, Romania
dragos.tofan.2014@gmail.com*

Abstract

Robotic Process Automation - RPA technologies are recognized through the prism of the benefits obtained by streamlining some operations considered routine but with a large informational volume and having a high risk of error. Organizations that have already applied such software tools have recorded an increased yield in the field of data collection and provision of information in departments or segments of operational flows, aspect quantifiable through various key performance indicators. Budgetary institutions are perceived as cumbersome bodies in their functionality both in terms of information processing speed and in terms of interaction with the general public, which makes them, in theory at least, the perfect client for RPA. This study reveals the specificity of the budgetary environment in Romania, as well as some successful examples of RPA implementation within the governmental structures of countries that have adopted such "robots" in their internal mechanisms. A contextual analysis is proposed in order to underline the opportunities to insert the automation of the operational flows of the public institutions in Romania.

Keywords: *robotic process automation; data analysis; digitalization.*

JEL Classification: M1, M2, M4, O3

1. INTRODUCTION – THE CONTEXT OF DIGITALIZATION

The term "digitalization" knows intense debates in society, academia and industry, through the lens of the impact on economic life and the development prospects of the technologies involved. Digital transformation is an ongoing process and is the subject of strategic policies at the level of states or community blocs, e.g. European Union, being allocated colossal budgets for their support. Digitalization takes on new dimensions as it occupies vast geographical territories, has complex applicability and acquires a strategic role. 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 labor in general.

Defining digitalization is not exactly an easy task due to the multiple implications of the notion and the increasingly varied fields of application. Academia defines digitalization 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 (2022) sees digitization as "the use of digital technologies to change a business model and provide new opportunities for revenue and value creation; is the process of transitioning to a digital business". Digital transformation is more about people and less about technology, as it is *organizational change* driven by radical challenges to corporate culture and *leverage of technologies* that empower and assist employees.

In the broad and complex context of digitalization, the automation of work, more precisely, process automation has a well-defined place and is achieved through tools with proven applicability. The need for cost reduction, operational efficiency, paper reduction and superior utilization of available human resource skills leads to the transformation of labor and positions within an organization. The automation of work processes, an approach initiated since the industrial age and found today in applications that replace manual data entry, has contributed to the development and implementation of Robotic Process Automation (RPA) solutions on a large scale in the area of information processing at various organizational levels. The origins of RPA can be found in "Screen Scraping" programs dedicated to extracting texts from any page or application user interface, web, image, HTML or PDF file, the results obtained being dedicated to end users, without further processing in the initial version (Liu, 2020). Robotic Process Automation applications, according to a definition given by Professor Leslie Willcocks from the London School of Economics, "mimic the activity that a human performs in order to complete a task within a process, performing repetitive operations faster, more accurately and on a duration longer than a human can achieve" (Luher, 2016). Thus, data is transferred from email or spreadsheet-type sources to other processing or recording systems – for example, from the Enterprise Resource Planning (ERP) and Customer Relationship Manager (CRM) category, the ease of such operations causing a generalized absorption of RPA at the level of large companies interested in reducing costs simultaneously with an increase in the quality of services provided and in a shorter time frame (Lacity, Willcocks and Craig, 2015).

Unburdening the human resource of repetitive, energy-consuming tasks and constantly at risk of inherent errors leads, thus, to an increased availability for creative, challenging and value-generating activities. It is the reason why there is an upward trend in the volume of investments in process automation, but also a diversification of the fields of application. According to a 2020 Gartner report, the RPA market is the segment with one of the fastest growth in the area of software products: 63.1% in 2018 and 62.9% in 2019, compared to 13.5%, respectively 11, 5% representing total market developments (The Gartner Group, 2022). At the same time, against the background of the COVID-19 pandemic

and, implicitly, the global recession, the same study estimates an acceleration of the insertion of RPA solutions to support remote work, the digitization of operations on physical/paper support. The losses recorded by the companies during this period determined an urgent need to reduce expenses by automating processes and by reducing the number of employees involved in performing redundant tasks. Thus, the Grand View Research report from April 2021 notices an increase in RPA adoption trends within small and medium-sized companies and a dimensioning of the profile market at the level of 13.74 billion dollars in 2028 (Grand View Research, 2021).

2. THE EUROPEAN CONTEXT AND METHODOLOGY

In March 2010, the *European 2020 Strategy* (European Commission, 2010) was launched by the European Commission with the aim of preparing the exit from the crisis as well as the economy as a whole for the next period. This strategy also includes the initiative "The Digital Agenda for Europe", which establishes the role of IT & C in achieving the general objectives proposed for 2020 - ensuring 5% of the European gross product with a market of 660 billion euros annually. The Digital Agenda had the following objectives in mind:

- Realization of the single digital market;
- Unification of telecommunications services;
- Increasing interoperability and standardization;
- Strengthening online trust and security;
- Promoting access to fast and ultra-fast internet for all;
- Making investments in research and innovation;
- Increasing digital literacy, skills and digital inclusion.

The second *Digital Agenda for Europe: 2020 – 2030* is built on the basis of the technological advances achieved and focuses on the essential role of digital markets and services (European Commission, 2020). On March 9, 2021, the European Union formalizes, in the Official Compass document, the four objectives to be achieved by 2030 and which can be summarized as follows:

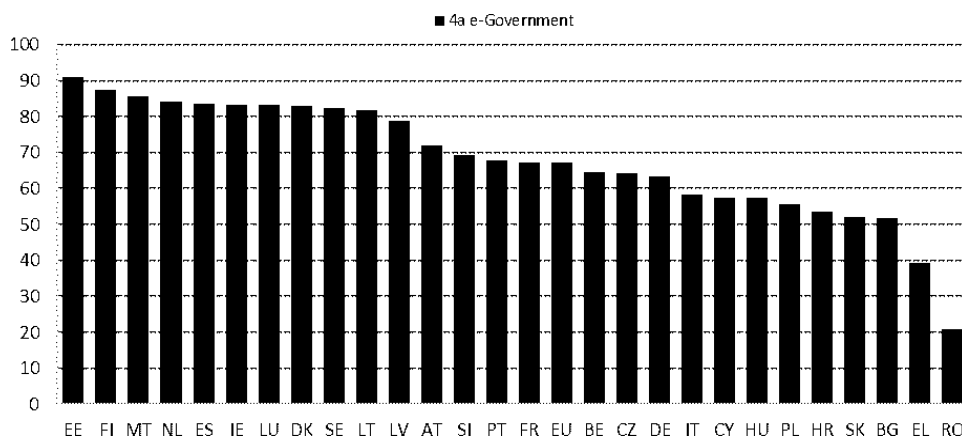
- ✓ *Increased education of the EU population in the area of digitization:* the achieving of basic digital skills for at least 80% of the adult population, the employment of 20 million IT&C specialists within the Union, simultaneously with the increase in the number of women holding such jobs;
- ✓ *Boosting the business environment:* the insertion of Cloud Computing, Big Data and AI services in at least 75% of companies, the digitization at a minimum level of more than 90% of small and medium-sized enterprises in the EU, as well as the doubling of the number of unicorns;
- ✓ *Development of digital infrastructure:* gigabit level connectivity for all European households, full coverage with 5G technology of all populated

areas, raising semiconductor production to at least 20% of world production, creating the first European quantum computer, etc.;

- ✓ *Digitalization of public services*: online availability of all essential public services, access for all citizens to personal medical files, application of electronic identity solutions for 80% of citizens.

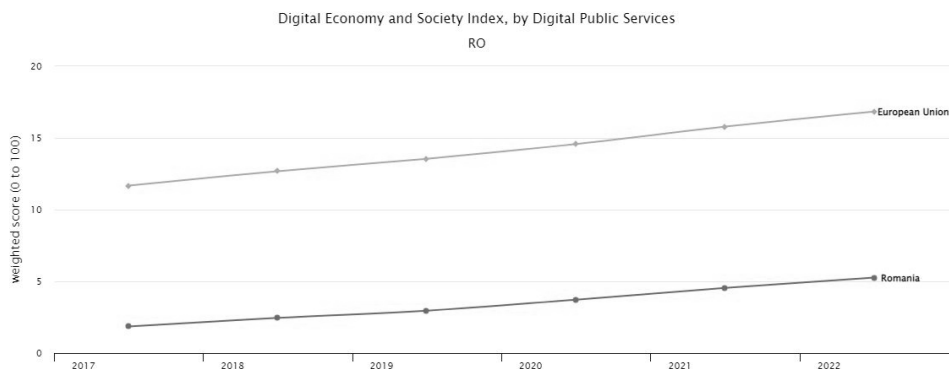
Regarding the last objective, which seeks to improve the efficiency of public services intended for citizens, aspects related to the increased pace of technological progress, budgetary limitations and changes in the demographic structure have outlined a series of particularities for Romania. Thus, within the European Union, progress in the digitization area has been constantly monitored since 2014 through the DESI index (Digital Economy and Society Index), which imposes a certain rigor in the way each member state understands how to build its own policies regarding each key element and adjacent sub-domains. DESI is a composite index covering four key areas: human capital, connectivity, integration of digital technologies and digital public services. The analysis published by the European Commission on July 28, 2022, based on the announced index, places Romania last in three out of four components of the index, connectivity being the only chapter where the position is 15. Regarding digital public services, Romania has approximately half of the score of the penultimate place, Bulgaria (Figure1).

Figure 1. Digital Economy and Society Index 2022, Digital Public Services



Source: DESI (European Commission, 2022)

The digitalization of public services in Romania is on an upward trend in recent years, but compared to the European average, the progress does not mitigate the difference recorded in 2017, according to the same source (Figure 2).

Figure 2. Digital Public Services indicator for Romania

Source: DESI (European Commission, 2022)

The Commission's recommendations were to move "to a significant change in the pace of Romania's preparation" to achieve the community's digitization objectives, as well as to develop a "flexible governance structure" to fulfill the national recovery and resilience plan (European Commission, 2022).

The article initiates an analysis of one of the DESI components, namely, *Digital Public Services* on the *Pre-filled Forms* indicator, with the aim of identifying the realities at the institutional level as well as possible solutions through the digitalization of specific processes. RPA applications are already implemented in European governmental organizations with concrete results in terms of the efficiency of the act of supporting citizens and digital education of end users, regardless of their position.

Form the methodological point of view, the paper considers the novelty character as well as the dynamics of the analyzed field leads to rigor in the selection of materials through the prism of the sources (it must be recognized and verifiable), the year of appearance, the relevance of the content (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 particular, publications in English were taken into account by introducing in the search process expressions such as: "robotic process automation in public services", "cognitive process automation", "intelligent process automation", "digital public services", "process automation tools for e-government". The use of the abbreviation "RPA" has been avoided as the acronym serves a broader terminology unrelated to the processes in question (e.g. Rubin Postaer Associates - advertising agency, Replication Protein A - the main protein that binds to single-stranded DNA in cells eukaryotes, Republican Party of Arkansas/Armenia – political parties, etc.).

The main research questions of the study can be summarized as follows:

Q1. What is the state of digitalization in the area of public institutions within the EU and in Romania, in particular?

Q2. What are the dilemmas of institutional digitalization in Romania?

Q3. What RPA solutions can be implemented to support the acceleration of process automation specific to public institutions?

Based on the research questions, the acceptance and exclusion criteria of relevant articles were established:

Acceptance criteria:

- The publications correspond to the theme of RPA and digital public services and contribute with answers to the proposed research questions;
- The titles and abstracts contribute to the research idea and contain the previously stated terminology ("robotic process automation", "tools process automation for public services", etc.).

Exclusion criteria:

- The publications are not written in English;
- The titles and abstracts do not contribute to solving the research questions although they include the terminology used for the search;
- The ideas or other relevant aspects of the research are repeated;
- The cited publication only compares existing research, without bringing new contributions or ideas.

Both acceptance criteria were considered in order to accept the information source and if only one exclusion criterion was checked, the article was not taken into consideration.

3. DIGITALIZATION AND INSTITUTIONAL ALIGNMENT IN THE PUBLIC SYSTEM

Regarding the *Digital Public Services* component, the indicator *Pre-filled Forms* analyzes the extent to which data that are already known by public administrations are entered in forms filled in by users (European Commission, 2022). In other words, based on the "once only" principle, the way in which the institutional registers are interconnected is monitored, as a necessary condition to avoid the repetition of data generated by filling in various forms by citizens. The information provided by the European Commission through the DESI composite index regarding the degree of informational harmonization through digitalization of administrative processes in the public system, shows a last place position for Romania in 2021. Thus, on the *Pre-filled Forms* indicator, the gap with top countries (Netherlands, Lithuania or Finland) approaching the score of 100 is considerable, Romania recording a score close to 20, being approximately 2/3 compared to the penultimate country, Cyprus.

The causes of such a positioning in the EU ranking can be multiple: the lack of adequate information systems within public institutions, insufficient human resources (with IT&C skills), the lack of a legal and procedural framework

suitable for a desired digitization, the urgent need for a functional and effective IT architecture (Panait and Rădoi, 2022). Important steps have been taken in the direction of accelerating digitization through the implementation of online platforms for citizens such as: the court portal - portal.just.ro, the system of the National Agency for Cadastre and Real Estate Advertising used to issue land book extracts - ancpi.ro, the national electronic system for the payment of fees and taxes - giseul.ro. At the same time, starting from 2020, the newly established Authority for the Digitization of Romania (ADR) expanded the functionality of these sites simultaneously with the implementation of new platforms and web applications created with the aim of providing information and support for citizens (a fact also determined by the pandemic context of Covid 19): [https://cetrebuiasafac.ro/](http://cetrebuiasafac.ro/), [https://stirioficiale.ro/informatii](http://stirioficiale.ro/informatii), [https://aici.gov.ro/](http://aici.gov.ro/), [https://diasporahub.ro/](http://diasporahub.ro/), [https://rohelf.ro/ro/](http://rohelf.ro/ro/), etc. However, the process of digital integration of the functionality as a whole of the budgetary administrative apparatus is still in an early stage. Thus, the indicator within DESI 2021 (European Commission, 2022), *Pre-filled Forms* refers to an extensive process through which the information accumulation is carried out by various means, electronically or physically/over the counter. Avoiding data redundancy is achievable by harmonizing registers managed at national level by various organizations or public institutions and by accessing information quickly, easily and securely. The statistics stated at the country level claim the need to reduce bureaucratic processes by accelerating the digitalization of administrative processes, especially those involving direct contact with citizens.

3.1. Particular case: social assistance services

In Romania, according to Law 416 of 2001, families and single persons whose incomes are below the monthly minimum guaranteed amount are entitled to social assistance. From a formal point of view, the beneficiaries must complete an application as well as a declaration on their own responsibility, accompanied by supporting documents regarding the composition of the family and the incomes achieved in the month prior to the submission of the application by its members. According to the law, the whole process is managed by municipalities, through departments or social assistance services that provide the specific forms to those interested, these being available in electronic format on the website, also. The analysis of the way in which the specialized structures understand how to manage the whole process reveals a series of shortcomings:

- ✓ *Registration of documents* - although it is possible to download the forms electronically, online submission is not possible, the classic "physical file" still being the only way to apply (Social Assistance Directorate-Pitesti, 2022);

- ✓ *Verification of the eligibility conditions* - the beneficiaries must notify the town halls of the change in the initial conditions related to income, assets, etc. (Social Assistance Directorate-Iasi, 2022).

In this case, eligibility is given by a set of mandatory conditions that must be met by the potential beneficiary in order to be selected for social assistance benefits and social services. In a first stage, a series of documents are requested that interested citizens must register, physically, at the counters or profile offices in the town halls. Uploading documents to a dedicated platform would reduce interaction and time wasted with such formalities and would create conditions for digital processing and storage of information in public service registers. Two particular situations are distinguished here in which automation can intervene by simplifying and securing the operations currently carried out by the employees of social assistance services/directions:

- Online upload of the requested data (forms, contracts, study documents, etc.);
- Internal data processing, creating profiles of social aid beneficiaries.

Collaboration with other public institutions that store data on income, assets, fiscal discipline, criminal record, health status is desirable in order to maintain a real-time monitoring of the situation and conditions for granting financial support. As far as the information processing within the municipalities is concerned, routine work is currently being carried out, processing documents on an overwhelming paper medium, going through repetitive stages simultaneously with the execution of cross-checking procedures based on records sent by the other state bodies (National Agency of Fiscal Administration, National Health Insurance, National Public Pension House, Judicial Records Service, etc.). The implementation of an information system that ensures the processing of data received from citizens simultaneously with the automatic access to registers or databases maintained at the local or national level by other public organizations simplifies the procedures, removes the risk of error and considerably reduces bureaucracy.

3.2. Automation through RPA in social assistance services

The need for streamlining operations that traditionally carried out at the counter as well as for standardized data processing procedures within dedicated municipal services is increasing as budget constraints and demands for social assistance become more acute in the current economic and social context. Thus, from the perspective of the social services involved, RPA applications have a number of specific advantages (Dilmegani, 2022):

- Increased operational speed;
- Cost reductions/savings to the local budget;
- Elimination of inherent risks of error.

Municipalities tend to stop hiring for budget reasons, but staffing needs may seem urgent. This is the case of New York City, whose mayor, Bill de Blasio, decided in February 2019 to continue the policy of freezing staff recruitment for a period of two years, according to a Bloomberg report. The pressure on the local authority, in this case, comes from two directions: the reduction of the amount of collected taxes (based on predictions and analyzes from Wall Street) as well as an increase in the population over 65 years of age in percentage of approximately 19% during the period between 2005 and 2015. The increase in the share of the aging population inevitably leads to an increase in municipal public expenditure, this example being only one component of a global trend: the increase in requests from citizens in conditions of reduction of public resources (budgets, human resources, logistics, etc.).

Iași County is part of the upward trend of population evolution over 60 years, according to the data available on the website of the Iași County Directorate of Statistics. Thus, between 2012 and 2017, this category registered an increase of over 9%, which puts additional pressure on local budgets (National Institute of Statistics, 2022).

RPA providers come up with solutions dedicated to such situations and claim that it is possible to increase productivity and improve public services even under budgetary constraints for at least two reasons (UiPath, 2022):

- *Relieving employees of repetitive, current and error-risk tasks* - thus, more time is allocated for specifically human reason, for activities with creative potential;
- *Using the same existing systems and tools* – RPA are non-invasive, flexible and foldable applications to already implemented information systems.

Analysis of the offer of the most important RPA product providers (UiPath, Automation Anywhere, Microsoft, SS&C Blue Prism, etc.) as well as the relevant literature (Fung, 2014; Luher, 2016; Chakraborti *et al.*, 2020; Liu, 2020; Lawton, 2021) leads to the conclusion that local authorities deliver the ideal "customer" profile for process automation. In this way, at least 4 stages can be identified in the development of operations specific to social assistance departments at the level of municipalities in Romania in which RPA systems can be integrated:

- ✓ *Entering/uploading data into the information system of the dedicated department within the town hall* (registration of the entire set of documents necessary for granting social aid, recording the results of social surveys provided for by law and decisions of local councils);
- ✓ *Data transfer/migration* (access and processing of data taken from other government databases or electronic registers at local or national level);
- ✓ *Data processing* (processing of forms and documents uploaded to the system);

- ✓ *Reports generation* (substantiation of decisions to grant or stop social assistance).

A realistic approach to RPA integrated in public services must take into account the legislative provisions, the conditions imposed by the available resources as well as the current concrete way in which data collection and processing operations are carried out. The projection of a desired scenario in which digitization takes over traditionally human tasks takes into account a whole series of conjunctural factors and is carried out on the structure of the 4 stages stated previously (Table 1):

Table 1. Automation through RPA - alternatives for social assistance services

Current processing	Process automation	
	<i>Data preparation</i>	<i>RPA role</i>
1) Data loading		
<ul style="list-style-type: none"> - Collection of forms and declarations downloaded from website, completed and submitted at the counter (classic „physical file“) - Centralization of documents in xerocopy - Receiving the results of initial and intermediate social surveys: reports, initial case files, reports, etc. 	<ul style="list-style-type: none"> - Electronic centralization of forms and declarations completed online by citizens - Centralization and uploading of scanned documents on dedicated platforms - Uploading by digital means the results of social surveys on the internal platform dedicated to city hall employees. 	<ul style="list-style-type: none"> - Retrieving data from digital sources – electronic forms (structured data) or from scanned documents (unstructured or semi-structured data) - Loading the data retrieved in Excel sheets or other applications already implemented within the organization.
2) Data migration/transfer		
<ul style="list-style-type: none"> - Collection and centralization of tax records, land register extracts, retirement decisions, account records, certificates, etc. in physical format (on paper) - Correspondence with other local and national authorities. 	<ul style="list-style-type: none"> - Accessing data basis/electronic registers of other public authorities - Document scanning and uploading to the dedicated platform - Development of electronic correspondence with other public institutions. 	<ul style="list-style-type: none"> - Data transfer and migration between databasis/registries of public authorities on a current or on-demand basis - Data cross check for duplicates, notify users, delete irrelevant data - Maintain data quality and accuracy.
3) Data processing		
<ul style="list-style-type: none"> - Preparation of individual beneficiary files submitted to the registry – verification, centralization, completion of beneficiary forms - Conducting initial and intermediate social surveys - analysis and evaluation of data/information collected from the field. 	<ul style="list-style-type: none"> - Completing the database, Excel worksheets or other available platforms with the information generated by the initial data processing - Scanning of additional documents obtained upon request or following social surveys. 	<ul style="list-style-type: none"> - Validation of electronically uploaded data, verification of IDs and personal information - Aproving electronically uploaded forms or directing it to other offices for approval.
4) Reports generation		
<ul style="list-style-type: none"> - Drawing up/editing the plan of social services - Drafting/editing the report in 	<ul style="list-style-type: none"> - Electronic centralization of collected data, of information 	<ul style="list-style-type: none"> - Collection of relevant data/information (structured, semistructured, unstructured) for

Curent processing	Process automation	
	<i>Data preparation</i>	<i>RPA role</i>
order to issue the Mayor's disposition for approving the service plan or granting /not granting/suspending the right to social assistance.	generated as a result of internal processing - Generating periodic/on-demand reports in order to monitor the status of social aid beneficiaries - Preparation of electronic layouts/drafts for reports/decisions/dispositions.	use in final reports - Automatic completion of report templates, decisions and dispositions with the collected information.

Source: own projection, based on available data from social assistance services websites (Iași, Argeș and Neamț counties), case studies and reports provided by RPA developers (Uiopath, Automation Anywhere, Microsoft) and legislation (Law 416/2001, Government Act 50/2011, 124/2011, etc.)

Beyond the advantages of automation (increased work speed, eliminating the risk of error, relieving employees of repetitive tasks and orienting them towards specifically human reasoning), a number of potential barriers should not be neglected. These are mainly generated by the stage of data preparation for automation as a minimum set of skills of the human resource in the area of IT&C technologies is required. Moreover, lack of information or awareness of RPA facilities leads to resistance to change and even fear of job loss. However, given the specifics of the activities, employees, relieved of a routine workload that can be demotivating, are given the chance for tasks with real and long-term impact, such as conducting social surveys or providing support services.

3.3. Case study: automation in social assistance services in Sweden

An example of success in the area of public services digitalization is given by the implementation of RPA within the social assistance authority in the Swedish city of Ronneby. According to the national agency responsible for providing statistics and newsletters on health and social assistance, a percentage of 4 – 4.5% of the population of Sweden receives assistance in the course of a year (Socialstyrelsen, 2021). The legal framework in this country stipulates the granting of financial assistance to households that have no other means of ensuring a decent standard of living and regulates the objectives of public bodies responsible for social assistance. Thus, the primary mission is to provide support through assistance to the beneficiaries with the aim of supporting them in obtaining sources of income and then, secondarily, providing financial aid until obtaining the status of financial independence. The support comes after monthly application of the requests, the first month having more extensive procedures and documentation elaborated for the initial registration in the system.

Similar to Romanian municipalities, in the Ronneby town hall, before automation, applications were on paper in most cases, although there was also the possibility of sending by email or uploading directly to the website. The final

decision, however, whether or not to grant social assistance, rests with the employees and not the mayor. An overwhelming part of the employees' tasks are of an administrative nature: centralizing applications, calculating due amounts, monitoring the status of beneficiaries, etc. Additional are the duties of assistance and consultation granted to applicants for social assistance with the aim of supporting them in the effort to achieve a degree of financial independence in the shortest possible time. Practically, the assistance includes three components: identifying the competitive advantages of the applicants to access the labor market, presenting the available jobs or internships, providing advice to overcome financial problems (unpaid bills, outstanding loans, etc.).

The automation through RPA implemented within the social assistance service of the municipality of Ronneby targeted administrative tasks, given their routine, repetitive nature as well as their considerable informational volume (Hauge, 2022). Became operational on February 12, 2019, the software robot - called Ronney by employees - has seen a gradual implementation within the organization, gradually acquiring the following tasks:

- the processing of applications received from applicants already registered in the system – it is a simpler version of RPA, the information being in a reduced volume;
- the processing of new applications – it is a more complex version of RPA, the volume of information to be processed being considerably larger and requiring initial checks;
- (the first two stages are completed by automatic notifications to social workers of new information related to "pending" applications)
- the control of applications – RPA periodically checks the approved files for situations in which it is necessary to withdraw the social aid.

The effects of automating processes through RPA in social assistance services in the city of Ronneby consisted of:

- ✓ shortening the period between the moment of initial application and the decision to grant financial aid;
- ✓ reallocation of social workers' time to assistance/consultancy activities;
- ✓ improving the accuracy of social aid granting decisions;
- ✓ shortening the average period of granting social aid - as an indirect effect of the additional dedication of social workers in providing support for the acquisition of the state of financial independence.

Reducing the period in which applicants need social assistance after finding a job will, over time, generate a series of cascading benefits for the municipality such as reduced social assistance spending or increased tax revenues.

4. CONCLUSIONS

The statistical results at the level of the European Union given by the DESI 2022 indicator outlined a worrying situation in Romania regarding the

digitalization process of public services. Thus, the considerable gap in the score compared to the countries at the top of the ranking on the majority of the components calls for a set of immediate measures from the government bodies and which will have a long-term impact on all the targeted areas of activity. Punctually, in the case of public services, the motivation for a generalized and effective digitization comes from the need to reduce public expenses, to eliminate bureaucracy and to make the act of serving citizens more efficient.

The article highlighted, in the current context of the Romanian public administration, the shortcomings of a delayed digitalization process and came up with proposals in the sphere of social assistance services to replace the famous "physical file" and to improve data collection and processing. Automation, as a component of digitalization, is a complex process, which must take into account the degree of preparation of the population in the IT&C sphere, a series of economic-social indicators as well as the organizational culture specific to budgetary institutions. The statistical data analyzed show that Romania is part of the European trend, and not only, of population aging, which puts additional pressure on public budgets, given that global crises (Covid 19 pandemic, economic convulsions) require spending reductions.

RPA applications come with concrete solutions for automating an important component of the work of employees in public services, namely, routine, repetitive tasks with a considerable informational volume and with an increased risk of error. Stages were identified in which these software solutions can intervene in the relief of employees, and the conditions preceding this process were drawn up in terms of data preparation. Undoubtedly, the fact that the information remains on a physical support (paper) cancels any automation effort, scanning operations, online platforms or modified working procedures being needed. The final decision to grant social aid or not is based on a complex process of analyzing data taken from applicants, from other state bodies or results from social surveys. Automation through RPA speeds up these operations and provides an increased degree of accuracy in profiling welfare claimants. The Swedish example revealed the fact that implementation is not possible overnight, this process being carried out in stages and over a period of time that can last over a year. Accurate analysis of the operational flow is essential in establishing concretely how RPA tools can prove their usefulness. It should be borne in mind that such automation can only be successful if there is a set of precise rules (derived from legislation, work procedures, etc.) on the basis of which the RPA can be built and possibly improved.

Beyond the technical details, the success of RPA is largely conditioned by the human resources, specifically how employees perceive these tools and accept them in the performance of specific duties. Awareness of RPA functionalities can be a first step in changing the way of working, in streamlining the operations preceding the decision to grant social aid. The transfer of the routine tasks of

data collection, sorting, etc. from the social worker to the IT tool does not imply a deletion of duties or the abolition of the position on the authority's staff. The social worker has the possibility to get involved additionally in the provision of assistance and in the running of social inquiries. The case study of the municipality of Ronneby highlighted the fact that beyond the direct and quantifiable results of the RPA installation, there are secondary and long-term effects determined by the decrease in the number of applicants for social assistance, and, finally, the reduction of public expenditure.

In the general effort to accelerate digitalization, RPA are concrete tools with proven results but which depend on a series of preliminary measures and a strategy aimed at the involvement of all decision-making factors and a rational use of all available resources. In the sphere of social services, the total and abrupt change of the operations and the allocation of considerable budgets for information systems may be unsuccessful and, most likely, without the desired effects. It is the reason why automation through RPA can be the right solution for the efficiency of the performance of the institutions concerned but also for an education in the spirit of digitalization of both citizens and social workers.

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FINANCIAL FRAUDULENT REPORTING USING EXPENDITURE FOR CONSULTANCY SERVICES. ROMANIAN LAW AND JURISPRUDENCE

MIHAELA TOFAN

*Alexandru Ioan Cuza University of Iași
Iași, Romania
mtofan@uaic.ro*

Abstract

The financial fraudulent reporting includes the use of methods and mechanism to reduce the tax liability, diminishing the tax amount either by increasing the deductible expenses artificially or by cosmeticizing the non-deductible expenses into false deductible. The paper evaluates the tools used in practice to qualify the expenses incurred for the provision of consulting services used by companies, in the context of Romanian taxation and the trends manifested in international taxation. Considering the very diverse nature of the points of view expressed in relation to this subject, the present analysis carries out an evaluation from a theoretical and jurisprudential point of view of the arguments used to establish the (non)deductibility for this category of expenses. Identified solutions are presented in the context of the volatility of the regulations at the national level, noting the stability of the interpretations given in the solutions pronounced by the national courts, but also the edifying role of the interpretations made by the Court of Justice of the European Union, even when the pending litigation does not explicitly address the issue the tax treatment applied to the amounts spent as consultancy.

Keywords: deductible expenses; consulting services; jurisprudence.

JEL Classification: B34, K40

1. INTRODUCTION

From a fiscal point of view, the concept of deductible expenditure is strictly related to the calculation of the fiscal result, that is, to the fair identification of the amount to which the profit tax rate is applied to determine the payment amount to the state budget. It is implicit that, if a taxpayer incurs a large volume of expenses qualified as deductible, the profit/net income tax will be correspondingly reduced. This is the justification for the increased interest of business entrepreneurs in classifying as "deductible" for as many of the incurred expenses as possible.

On the contrary, for the collection of important sums to the state budget, the opposite behaviour is justified, namely the tendency to limit or exclude the deductibility of expenses that are not objectively justified in relation to the particularities of the respective business. In other words, establishing the

deductible nature of the expenses incurred by a taxpayer always requires a complex and thorough analysis, from both points of view highlighted above, by interpreting the relevant legal norms and with reference to the jurisprudential interpretations formulated in situations brought to judgment.

In accordance with the applicable legal provisions, not all expenses incurred by an entrepreneur are deductible from the calculation of the profit tax. Based on the European Union member countries sovereign right to rule taxation (Tofan, 2022), there are large differences in the fiscal treatment for the deductible expenses.

Because of the flexibility of the economic reality that we face, Romanian tax legislation is very volatile, including in this area that we are analysing, and the regulations in the Fiscal Code have redefined the general principle of deducting expenses. If until 2016, the deductibility is interpreted through the lens of the purpose pursued at the time of the respective expenditure, being the expenses incurred to obtain taxable income, after January 1, 2016, the condition of deductibility is considered fulfilled if these expenses are carried out for the purpose carrying out the activity of the respective entrepreneur (Tofan, 2016). The legislative amendment was justified by the need to clarify the application of the previous regulation, certain expenses being unnaturally excluded from the deduction. In other words, the new expanded definition would benefit taxpayers by ensuring uniform and simpler tax treatment in all possible cases.

In this context, our analysis aims to identify the fair ways of qualifying the deductibility of consulting expenses for the identification of taxable profit, in the case of taxpayers targeted by this tax treatment from the Romanian authorities. Methodologically, the work aims at an analysis from a theoretical perspective, but also from a jurisprudential point of view, considering the analysis of the points of view formulated in the solutions pronounced by the national courts and those pronounced relatively recently by the Court of Justice of the European Union. At the level of European jurisprudence, the subject is treated indirectly, there being no uniform provisions regarding the method of establishing fiscal obligations regarding the taxation of businesses. At the same time, the impact of the amendments adopted in the Fiscal Code of Romania, starting from January 2016, regarding the classification of consulting expenses made by enterprises, from the perspective of the objectives established at the time of the adoption of the legislative amendments, is evaluated.

The paper is organized starting from the analysis of the opinions expressed in the national doctrine on this subject (section 2), continues with the analysis of the qualification of the deductibility of consultancy expenses at the legislative level (section 3), but also jurisprudentially (section 4), and ends with highlighting the conclusions drawn from the research carried out (section 5), in the context of formulating some limits of the investigation carried out and some future directions of analysis.

2. STATE OF ART ON DEDUCTIBLE EXPENSES QUALIFICATION BY DOMESTIC LITERATURE

In the doctrine it is noted that tax systems allow a taxpayer to a certain extent to analyze the normative spectrum, most of the time by using a tax consultant, for different solutions to implement his economic and, implicitly, tax policy (Tanzi and Zee, 2001). Implicitly, when calculating the fiscal result, fiscal optimization aims to include the expenses made as widely as possible within the scope of deductible expenses, although not every expense highlighted in the taxpayer's accounting is implicitly also tax deductible (Burns and Krever, 1998; Coștaș, 2021). At the same time, the digital economy is associated with major challenges for the international tax system and traditional tax laws are governing new ways of conducting business (Șaguna and Tofan, 2010) and current international tax law and its underlying principles “may not have kept pace with changes in global business practices” (Olbert and Spengel, 2017). Taxpayers use various methods and mechanisms to justify the deductibility of consulting expenses, a subject that is even more important in the case of related parties (OECD, 2014).

To reduce the tax burden (Coștaș, 2019), the taxpayer is free to use all the levers deriving from the freedom of management:

- the right to reduce the tax burden, the taxpayer avoiding creating taxable matter; this means that each taxpayer benefits from the freedom to choose between making or not making a profit;
- the right to opt for the solution that generates the lowest tax, subject to its legality;
- the right to be wrong. It is accepted that, in business, every entrepreneur has the inalienable right to make mistakes, to get involved in inherent businesses resulting in losses, negative economic results, etc.

The use of these mechanism is strongly criticized by the fiscal authorities, strongly debated and motivated by the taxpayers and ultimately justified by the courts, among which the opinion presented by the Court of Justice of European union is mandatory for all European Union member countries and prevails in any subsequent litigation (CJEU, 2019).

Implicitly, the doctrine in the field shows that a taxpayer can contract any services that have a "connection" with the "purpose of the activities carried out", but the analysis is so coarse that it serves no purpose (Tofan, 2019a). At the same time, this margin of interpretation can also lead to new approaches from the tax authorities, because, along with the change in the definition of the general principle, the old provisions were also eliminated, including from the law enforcement norms that contained examples and clarifications that both control authorities and taxpayers used them in the analysis of management and consulting expenses (Coștaș, 2020). Management and consulting expenses have generated different interpretations and points of view for practitioners and

representatives of tax authorities, both based on the provisions in force until 2016 and on the side of the new provisions, with no uniform opinions or case solutions with interpretative value being outlined mandatory (Tofan, 2019b). At the same time, however, the interest of some clarifications is justified by the relatively frequent use of consulting services in the activities carried out in the current context, the paper contributing to the enrichment of the literature in the field.

3. MEANS TO ESTABLISH DEDUCTIBLE TREATMENT FOR CONSULTANCY EXPENSES FOOTNOTES

After the year 2016, the expenses for consulting services are not qualified as non-deductible, nor are they found with explicit provisions in the methodological rules for the application of the Fiscal Code (Lazăr, 2016). The only principle that must be respected is aimed at carrying out the economic activity, according to art. 25 para. (1) from Law no. 227 regarding the Fiscal Code and are based on supporting documents, according to Law no. 82/1991.

As mentioned before, the internal regulations regarding the principle of qualifying deductible expenses have undergone important changes, starting on January 1, 2016. In addition to the modification of the general principle of deductibility of expenses, two articles widely used in the practice of tax authorities have been removed, respectively art. 21 para. (4) lit. f) C. fiscal. regarding the supporting documents, drawn up in accordance with the formal accounting regulations, and art. 21 para. (4) lit. m), which, indirectly, also constituted the legal basis of the supporting rules for the deductibility of management, consulting, and service expenses, such as existence of the written contract, proof of execution, necessity of the purchased service, etc. (Bufan, 2016).

From a tax point of view, expenses can be deductible, partially deductible, or non-deductible (Tofan, 2016). The regulations of the Fiscal Code are corroborated with the provisions of the Fiscal Procedure Code, which provides, in art. 73, that the burden of proof to prove the fiscal situation rests with the taxpayer. Since, from an accounting point of view, the records are operated only based on supporting documents, a regulation that was not changed simultaneously with the changes included in the Fiscal Code, in 2016, the list of previously used documents, from an accounting point of view, remains valid.

This list includes supporting contracts for registered expenses, statements of works for service contracts, receipt minutes for joint venture contracts, work reports, feasibility studies, market studies or any other appropriate materials. Even if the tax legislation does not expressly provide for them, these documents should exist to justify the accounting records and, being at the disposal of the taxpayer who bears the burden of proof for establishing the tax situation, they will implicitly be used to prove the deductibility of expenses, including for the

qualification of services of consultancy generating expenses recorded in the company's accounting (Bufan, 2018).

According to art. 25 Fiscal Code, the difference between deductible and non-deductible expenses depends, first, on the objective pursued at the time of their realization. The rule included in the regulatory text provides that "expenses incurred for the purpose of carrying out the economic activity are considered deductible expenses". As a result of the specialization of the legal capacity for legal entities, the purpose of the economic activity carried out must be in accordance with the business object of the enterprise. A deductible expense for a company is not necessarily tax deductible for another legal entity, which has a completely different object of activity. According to the relevant literature in this field (Gurău, 2017), other categories of deductible expenses expressly mentioned in art. 25 Fiscal Code, which can justify, even indirectly, deductible expenses with consulting services, include:

- expenses incurred for safety and health at work, according to the law;
- the expenses incurred in order to comply with the compensation obligations provided for by the Government Emergency Ordinance no. 189/2002 regarding compensatory operations related to procurement contracts for defense needs, public order and national security, approved with amendments and additions by Law no. 354/2003, with subsequent amendments and additions;
- expenses incurred by economic operators with the evaluation/reevaluation of tangible fixed assets that belong to the public domain of the state or administrative-territorial units, received under administration/concession, as the case may be, expenses incurred at the request of the head of the institution holding the property right;
- the expenses incurred by economic operators with the registration in the land registers or real estate advertising registers, as the case may be, of the property rights of the state or administrative-territorial units over public goods received under administration/concession, as the case may be, expenses incurred at the request of the head of the institution owner of the property right;
- expenses incurred for the organization and development of professional and technical education, dual pre-university and university education, according to the legal regulations in the field of national education;
- advertising and publicity expenses incurred in order to popularize the company, products or services, as well as the costs associated with the production of the necessary materials for broadcasting advertising messages;
- transport and accommodation expenses in the country and abroad and for other natural persons, provided that the respective expenses are incurred in connection with works performed or services provided by

them, for the purpose of carrying out the economic activity of the taxpayer;

- expenses for marketing, market research, promotion on existing or new markets, participation in fairs and exhibitions, business missions, editing of own informative materials;
- the expenses incurred with the editing of publications that are recorded as returns during the taxable profit calculation period based on the supporting documents and within the limits of the quotas provided in the distribution contracts;
- expenses representing penalty interest, penalties and damages, established within the contracts concluded, in the course of the economic activity, with resident/non-resident persons, according to their registration.

Tax authorities will focus on scrutinizing (large) payments for consultancy by their taxpayers, but have in general little information (without a specific query) on the nature of the consultant's facilities on the premises of the client. In practice therefore, their attention is mostly drawn by cases where the presence of the consultant is obvious and important (Bruggen, 2010).

Regarding the partial deductibility of some expenses, the regime of regulations in the Fiscal Code is of strict interpretation and does not include direct references to expenses for consulting services, a hypothesis in which we consider that such a qualification does not need to be analysed (European Commission, 2014).

In relation to those consulting expenses that could be qualified as non-deductible, the Fiscal Code includes only one reference regarding consulting expenses, respectively art. 25 para. (4) lit. f), which refers to management, consulting, assistance, or other services of this nature, provided by a person located in a state with which Romania has not concluded a legal instrument, based on which an exchange of information can be carried out, and which are carried out because of transactions qualified as artificial. This regulation has a very narrow scope, limited only to artificial transactions.

We observe that in the current version of the regulations, the explanations previously included in the methodological rules for the application of the Fiscal Code regarding the conditions for qualifying consulting expenses as deductible expenses are missing.

These provisions established in point 48 that to deduct expenses for management services, consultancy, assistance or other services, the following conditions must be met cumulatively, as presented in Table 1.

Table 1. Conditions to determine deductible treatment for consultancy expenses

The imperative condition	Means of justification
the taxpayer must prove the necessity of making the expenses through the specifics of the activities carried out	the justification of the actual provision of services is carried out through:
the services must be provided, executed on the basis of a contract concluded between the parties or on the basis of any contractual form provided by law;	<ul style="list-style-type: none"> - work reports, - reception minutes - work reports, - feasibility studies, - market studies - any other appropriate materials;

Source: author analysis

Methodological Norms for Romanian taxation expressly established that: "For management services, consultancy and technical assistance provided by non-residents affiliated with the taxpayer, when analysing the transactions to determine the deductibility of expenses, the principles in the commentary to Article 9 regarding taxation of associated enterprises in the OECD Model Convention on taxes on income and taxes on capital (OECD, 2017). The analysis must consider:

- (i) the parties involved;
- (ii) the nature of the services provided;
- (iii) the elements for the recognition of expenses and income based on supporting documents certifying the provision of these services."

Noting the strict and objective nature of the elements considered in these previously regulated conditions and considering the time span of more than 10 years in which they have been constantly used, some pertinent comments can be deduced for their use, if only as a tool of analysis still used to establish the objectively deductible character of consulting expenses. As in the previous regulation, the evidence that a taxpayer must present to justify the deductibility of consulting expenses is very diverse, depending on the type of economic activity that it carries out. Evaluation reports, activity sheets, conclusions of the analyses carried out, feasibility studies, work reports, work reports, feasibility studies, market studies or any other materials and possibly a reception report etc. are included. In relation to the price of consultancy services, the provisions of the current regulation on transfer pricing apply, in accordance with OECD recommendations.

It is easier to identify and administer the relevant evidence to support the deductibility of consulting services, assuming that those services were provided under contracts that include performance obligations (for example, carrying out a feasibility study).

As it was shown in the doctrine, the reality of the provision of the service must not be doubled by the justification or verification of the necessity by the fiscal body, because it would represent a violation of the principle of freedom of management of the economic agent (Bruggen, 2010). Businesses often choose to outsource services that were previously performed in-house. Just as the labor legislation considers the dismissals of these categories of personnel to be justified, implicitly, the fiscal legislation should allow, in these situations, the contracting of the respective services through external parties, including in the case of providing them as consulting services (ILO, 2016). Similarly, when, within affiliated groups of legal entities, certain services are provided in their entirety, the deductibility of expenses with consulting services by the parent company or by other companies in the group of companies that has the object of activity the respective activity performed.

The amount of these expenses, which must be supported by arguments specific to transfer prices, remains under discussion, as I stated above. Some services are considered *ab initio* as producing minor benefits for the affiliated company (or, in the language of the OECD Guidelines, low-value adding intra-group services), given the fact that they do not represent its field of activity (OECD, 2014). The nature of the services therefore becomes important to the benefit test. However, we appreciate that the nature of the services must remain a subsidiary criterion to the organizational structure, for example, since, even in the situation where their provision does not require the use of valuable intangible assets, they may still be indispensable to the functioning of the affiliates.

At the level of cross-border economic activities, for reasons of economic optimization, the groups end up sharing certain expenses within themselves, for example, for legal, fiscal or accounting consultancy services, management, IT, advertising and others. Such services, although in principle considered provided for the benefit of the group, may be deductible including at the level of affiliated companies, if they can prove the existence of a benefit of their own. The guidelines drawn up by the OECD and refer, in this case, to the notion of a "benefit test".

From a practical point of view, any analysis of this type has as its starting point the establishment of the effectiveness of service provision. In other words, we cannot talk about the existence of benefits, of commercial/economic improvements at the level of the affiliated enterprise, if the services are not actually provided. In the same sense, the Romanian legislator also regulates, which, in the Methodological Norms for the application of the Fiscal Code, expressly provides that "the mere existence of services within a group is not sufficient, because, as a general rule, independent persons only pay for the services that were provided in fact". There are several ways to prove the actual provision of services. An indication is the organizational structure of the affiliated company itself. Thus, it must be checked whether the affiliated entities,

intended to benefit from the services, have specialized compartments for the type of service. At the micro level, the situation of the lack of specialized personnel is the same. In addition, the actual provision of services must be supported by supporting documents such as *lato sensu* service contracts, invoices, activity reports, etc., of great importance in performing the test.

The benefits test is used to determine the remuneration of intra-group services in accordance with the market value principle. The taxpayer, as well as the competent tax authorities, must consider whether the independent persons would have contracted the respective services under the same conditions established by the affiliated persons, considering the rates used on the comparable market. To derogate from the rule of the most appropriate method, the Romanian legislator, in the Methodological Norms for the application of the Fiscal Code, establishes, as a method to be used in establishing the transfer price for intra-group services, in the absence of comparable tariffs, the cost-plus method (Tofan, 2016). Even if the deductibility of VAT and the deductibility of expenses for the provision of services are not confused, there are VAT regulations that provide support regarding the documents useful for justifying the deductibility of expenses with consulting services (Costaş, 2021).

Of course, the first supporting documents for such services are the invoice and the contract for the provision of that service. In the case of services that determine successive settlements or payments, such as construction-installation services, consulting, research, expertise and other similar services, such supporting documents are considered work situations, work reports, other similar documents based on which they are established the services performed or depending on the contractual provisions, on the date of their acceptance by the beneficiaries.

In the case of service contracts, in which the client has undertaken to pay lump sums as remuneration agreed between the parties, regardless of the volume and nature of the services provided in the period to which this remuneration refers, the services must be considered performed in the period to which the payment relates, regardless of whether the provider has provided services to its customer during this period. In the case of such contracts, the object of the provision of services is not the provision of well-defined services, but the fact of being available to the client to offer him the contracted services, the provision of services being performed by the provider by the very fact of being available to the client in the period established in the contract, regardless of the volume and nature of the services actually provided in the period to which this remuneration refers.

4. JURISPRUDENTIAL LANDMARKS IN CASES REGARDING THE DEDUCTIBILITY OF CONSULTING EXPENSES

Regarding the *modus operandi*, used by the fiscal bodies for issuing tax decisions for the period 2006-2008, the analysed national jurisprudence (Romanian High Court of Cassation and Justice, 2022) holds that the taxpayer's registration of tax deductible expenses registered in analytical account "Royalty expenses-logo use", was justified by accounting documents (invoices issued by a company in France, as an explanation for the services provided, with the payment of royalty services for the use of the name and the logo, respectively the logo and the insignia of the parent company). The fiscal inspection bodies found that the use of the name was a fact imposed by the will of the sole associate since its foundation, according to the company's articles of association. Moreover, it is noted that in the contract concluded between the parties regarding the use of the name and the logo, the French company ceded both the right to use the name and the logo on the documents drawn up, as well as the necessary assistance in order to protect the name, and the bodies of tax inspection found that the amounts paid by the company in Romania for the use of the logo were treated as non-deductible for tax purposes when calculating the profit tax for a period of three years, according to the tax record register, and subsequently their tax treatment was changed, in the sense of deducting these expenses. The company in question did not present arguments, not justifying that these expenses were necessary and related to income and, based on the existing affiliation relationship between the two companies, the tax inspection bodies established the non-deductibility of these expenses and calculated the company's tax on additional profit.

In relation to the allocation of consultancy expenses, the tax authorities have assessed that the appellant company did not present supporting documents for the expenses incurred, namely work statements, reception minutes, work reports, feasibility studies, market studies or any other materials corresponding, certifying that the services were actually provided. The lack of these documents, as well as the lack of details related to the invoiced amounts and their connection with the achievement of the company's benefits, determines the inclusion of the expenses in the category of non-deductible expenses for tax purposes. Different tax treatment of the expenses applied by the taxpayer itself has been interpreted as an implicit recognition of the fact that these expenses are not deductible. Moreover, since the contract for the provision of consulting services does not explicitly include the detailing of the services offered, but only their generic designation and the obligation to be paid in proportion to the share of the company's sales in Romania, within the group to the nominated client, the fiscal inspection bodies found that the company did not present sufficient documents for the necessary nature of the expenses incurred. The lack of details related to the establishment of the invoiced amounts and their connection with the

company's income, the expenses for the provision of consulting services for research and development are non-deductible expenses. Therefore, these amounts were treated as non-deductible when calculating the profit tax.

A special hypothesis is the provision of administration and management services (consulting, management) by a holding company. Such services have a certain specificity and are circumscribed, by way of example, to the following activities: stock exchange listing of the parent company, audit services at the level of the parent company and, in general, ancillary services to corporate governance. To the extent that such services are provided by a company precisely by virtue of its quality and its associate interest, they cannot be considered services that benefit the group, which is why they cannot justify an expense at the level of the affiliated company, but only an expense at the level of the holding company.

The High Court of Cassation and Justice established that, to be deductible when calculating the taxable profit, expenses for management services, consultancy, assistance, or other services must be based on a contract concluded between the parties, be actually provided and be necessary for their beneficiary in relation to the specifics of the activities carried out. In Decision no. 740 of February 22, 2018 (Romanian High Court of Cassation and Justice, 2018), the administrative and fiscal litigation section of the High Court of Cassation and Justice noted the general nature of the documents submitted to justify deductibility (consultancy contract regarding access to European structural and cohesion funds, accompanied by annexes, orders and of the related invoices, as well as the reception minutes), which, although they refer to the general object of the contract, do not reveal, in concrete terms, what these services consisted of, given that the procedure for accessing the structural funds has a complex character, and without presenting possible work reports related to the time allocated to each service, given that the invoices were issued for hours worked, and the orders related to the contract have in mind different activities, such as project preparation/development, documentation in order to realize the project, establishing partnerships, developing projects and elaboration project-completion".

In the solution handed down on March 17, 2021 (Romanian High Court of Cassation and Justice, 2021), the court considered the complexity of the transactions within the group, concluding that, without the support services, the company would not have been able to carry out its operational activity under the same conditions, and their contracting is an expression of the principle of freedom of management, a principle guaranteed by the Constitution. This explicit mention of the principle of freedom of management should, in our opinion, contribute to changing the approach of the tax inspection bodies regarding the deductibility of consulting services, and affiliation relationships

between companies should no longer be seen as the beginning of evidence for incurring liability tax of the taxpayer.

At the level of the relevant jurisprudence of the CJEU, we mention the interpretation given by the decision of the Court of Justice of the European Union, in case C-463/14, Asparuhovo Lake Investment Company OOD (CJEU, 2015). The court held that, including in the case of consulting, legal, accounting, expertise, maintenance, service, as well as in the case of other similar services, for which no work reports or other situations are drawn up on the basis of which the provider certifies services provided, but contracts are concluded between the companies involved, it is important to establish the correct tax treatment if the beneficiary actually used or how often he used the services of the provider.

5. CONCLUSIONS

In relation to the deductibility of expenses for consulting services, in the current regulation it is essential for the taxpayer to be able to prove with supporting documents the reality of the amounts used and the necessity of the contracted services.

In the application of the principle *ubi eadem ratio eadem solutio esse debet*, the same elements must be proven if the value of the consulting services is shared between affiliated companies. It is essential not only to have the contract justifying intra-group relations, but to prove that those expenses are allocated to the tax resident taxpayer in Romania, based on objectively identified criteria and in compliance with the transfer pricing provisions. We can conclude that, in the case of intra-group advertising services, the benefit test is doubled by a proportionality test, which exactly reflects the sharing of common expenses between related persons.

Justifiably, the practitioners in the field of tax law, but also the representatives of the concerned business entrepreneurs, considered the amendment of the regulations of the Fiscal Code regarding the deductibility of the expenses of consulting services as causing effects in favour of taxpayers, by increasing the degree of flexibility of the administered evidence and including all possible scenarios subject to the regulations in force.

In our opinion, the expansion of the scope of the principle of deductibility does not automatically imply the expansion of the scope of deductible expenses regarding consulting services, and practice reveals that the prudence with which some taxpayers act, using the same type of documents previously imposed by the rules in force, has the purpose of to limit the differences in the interpretation of concrete situations by the tax authorities in relation to the qualification of those expenses, in the opinion of the controlled taxpayer.

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THE IMPORTANCE OF HEALTH FOR A COUNTRY'S ECONOMY. THE CASE OF ROMANIA

MIHAELA TOMAZIU-TODOSIA

*Alexandru Ioan Cuza University of Iași
Iași, Romania
mihaela.tomaziu@gmail.com*

FELICIA- CĂTĂLINA APETROI (RACOARE)

*University of Seville
Seville, Spain
apetroifelicia@yahoo.com*

IULIANA- CLAUDIA MIHALACHE

*Alexandru Ioan Cuza University of Iași
Iași, Romania
mihalacheclaudia22@yahoo.com*

ECATERINA ANTON

*Grigore T. Popa University of Medicine and Pharmacy
Iași, Romania
eca1998tomaziu@yahoo.com*

Abstract

A state's economic development has always been based on its citizens' health. Health contributes significantly to economic development, influences the economy, and is influenced by the economy. On the one hand, a country's economy is influenced by its population's health due to a lack of labor, early retirement, and demand for the medical system while on the other hand the economy is influenced by the population's health due to a lack of prevention measures. This study aims to highlight both the impact of health on the economy and the impact of the economy on health through qualitative and quantitative analysis. We intend to focus on Romania's status in terms of cardiovascular disease costs and the determinants of these diseases (the economic impact of health), as well as the economic impact of health on the economy through prevention programs. The research focuses on cardiovascular disease, which affects a large percentage of the population and is one of the primary causes of death.

Keywords: *economy; management; healthcare system; development.*

JEL Classification: A12, B26, H51, I15

1. INTRODUCTION

The way health is viewed in society reflects the ideals of that society and demonstrates support for health promotion and care among its people. The health of a country is linked to a variety of factors such as income, employment, housing, and utilities, as well as equity and the quality of health and education services. According to World Health Organization criteria developed in the previous 30 years, health is defined as a condition of physical, mental, and social well-being, not just the absence of sickness. Individual health is now more than ever tied to the concept of quality of life, according to this modern definition.

In modern times, a community's health has become much more vulnerable and dependent on both the country's financial status and the health of other communities, as well as the availability of fast transit to any location on the globe. Despite the efficacy of national legislation in this area, the transportation of people and goods, as well as increased migration, poses a risk that health authorities can only partially regulate. As a result, less developed nations' development and health issues might have an indirect impact on developed societies. These kinds of issues have spawned common strategies for regional cooperation between countries, with the help of global organizations like the World Health Organization and European Union regional forums, with the goal of finding solutions to improve global or community health problems and standard of living.

2. PROBLEM STATEMENT

The topic of public health has a significant impact on the entire population. The flaws in this system effect every patient or potential patient, which is why there is so much public interest in this issue. The desire to investigate this topic stems from the need for a balanced state of population health, which is mirrored in the economy. As a result, a health system must be viewed as a whole, in connection to the national economy's goals. Starting with the World Health Organization's concept of health system performance, the objectives in the health field refer to three aspects: (1) population health, (2) citizen satisfaction with the performance of the health system, and (3) the extent to which the system provides financial protection. As a result, research on the relationship between health and the economy is of broad interest.

3. RESEARCH METHODOLOGY

This study's research technique incorporates both qualitative and quantitative methods. Qualitative research allows for a thorough grasp of the research issue through procedures like analysis and synthesis, which ensure the construction of an accurate image of the phenomena under investigation. The qualitative dimension will aid in the examination of bibliographic material as well as the field's current level of knowledge. The literature study focuses on

identifying and explaining concepts, as well as studies on socioeconomic determinants of health, the importance of the economy for population health, and the role of health in a country's economy. We determined (1) the correlation between the percentage of GDP allocated to the health sector and patients with cardiovascular disease, (2) the degree of coverage of the population with basic health services, and (3) expenses for the treatment and prevention of heart disease after identifying and analyzing the conceptual framework based on the literature and existing studies in this area. The quantitative element of the research approach relies on grouping, comparison, and secondary data analysis methodologies; data from official sources, such as www.ec.europa.eu and www.insse.ro, were used.

4. LITERATURE REVIEW

The deteriorating effect of health is becoming more and more costly. Therefore, as health deteriorates, the costs felt in society are increasing: the treatment and the impossibility of employment are the main direct costs, along with indirect costs, more difficult to measure, transposed into the suffering of the patient.

The association of good health with financial gain was first introduced by Grossman (1972), in an explicit attempt to emphasize the importance of health in human capital. He predicted that while the stock of human capital influences the rate of pay of individuals, the stock of health determines the time they can devote to making money. Another basic element of the Grossman (1972) model is the hypothesis that individuals have an initial stock of health that depreciates over time, but that can be (partially) restored by investing in their own health.

Globally, according to the WHO (2008), cardiovascular disease is the leading cause of death. About 17.5 million people died of cardiovascular disease in 2005, accounting for 30% of all global deaths. About 80% of these deaths occurred in low- and middle-income countries. WHO (2008) has warned that by 2025, about 20 million people will die from these conditions.

A report by the British Heart Foundation (Allender *et al.*, 2007) shows that cardiovascular disease is also the leading cause of death in the United Kingdom with 2.38 thousand deaths in 2012, accounting for 39% of all deaths among women. The same report states that approximately 227,000 heart attacks occur annually in the UK.

Compared to 2000, the number of years of productive life has decreased due to cardiovascular disease. The Indian subcontinent (including India, Pakistan, Bangladesh, Sri Lanka and Nepal) is known to have the highest rates of cardiovascular disease globally. According to Bromfield and Muntner (2013), hypertension has become a major health problem in India and has a severe impact on the health of the population. WHO (2005) estimated that the loss of

productivity due to premature death and disability cost India nine billion dollars in 2004, an amount that was estimated to increase by 2025 to 237 billion dollars.

Given the growing number of cases of cardiovascular disease, as well as the importance of reducing this phenomenon, research is increasingly focusing on the determinants of health in this area. They can be an essential aspect in reducing the mortality rate, but also in supporting the health of the population.

5. SOCIAL DETERMINANTS OF HEALTH

WHO (2007) defined the social determinants of health as “the conditions in which people are born, grow, live, work and age” and “the fundamental determinants of these conditions” (WHO, 2007, p. 12). Socio-economic factors such as income, wealth and education are fundamental causes of health outcomes; therefore, we can emphasize the socio-economic importance as an important factor in shaping health, along with biological mechanisms.

Social determinants are directly linked to the economy and health, so they include a series of measures designed to support the balance of society.

(1) *Social dialogue* means the participation of beneficiaries in the creation and implementation of policies on the determinants of health. This type of program must start with the needs of the communities, but in many cases, actions taken in support of disadvantaged groups may not be tailored to their needs; This requires dialogue and exchange of views between decision-makers in the development and implementation of such policies and their beneficiaries, in order to identify the problems facing a group and, through specific programs, the necessary solutions.

(2) *The restructuring of life and work* refers to the need to adopt and maintain a correlation between living and working standards. Economic development should provide opportunities for everyone to better their quality of life and work environment; the possibilities through which people can evolve, being interdependent with social dialogue and other determinants of health and the economy. For example, there are people who cannot progress professionally because their health does not allow them, others, because their studies do not allow them, because they have a criminal record, etc. Social protection is meant to support overcoming these impediments, but tailored to the needs of each; with the restructuring of work, there is an evolution of the quality of life that must be maintained.

(3) *The promotion of occupational health and safety* aims at health as an indispensable factor in the economy, namely its protection in the work environment. Deteriorating health at work leads to a lack of labor, which is why it is necessary to develop social protection programs, designed to provide support in prevention in this segment.

(4) *The promotion of environmental protection policies* is implemented with the role of protecting health by reducing factors such as pollution, but also the economy, by caring for the well-being of people.

(5) *Collective welfare* is often related to living conditions, health, work, environment, the level of the national economy, with effects on future developments.

Over the past decade, researchers have become more aware of the economic effects of evolving trends in morbidity and mortality among people with cardiovascular disease. The main risk factors for this type of disease were identified in a study by D'Agostino *et al.* (2008), in Massachusetts, between 1948 and 2007, on three generations of people. The most common factors were: age, diabetes, cholesterol, systolic blood pressure and smoking. A global study by Yusuf *et al.*, (2004) and conducted by McMaster University in Canada, also identified the same risk factors for myocardial infarction, adding stress, lack of daily consumption of fruits and vegetables, and lack of daily exercises in over 37,000 patients in 55 different countries and different cultural backgrounds. Middleton, Leong and Mann (2008), Groah *et al.* (2011) and Lieberman *et al.* (2011) concluded that the key cardiovascular risk factors for the poor are the same as for the well-off population, although in the case of people with poor health, almost all of these risk factors are amplified, including physical inactivity, unbalanced diet, lack of regular medical consultation.

Cardiovascular disease has therefore been identified as a priority area for improving health in most European countries. According to Schwamm, Reeves and Frankel (2006), both in Europe and in the USA, the modernizations in the hospital units always started with the cardiology departments, as a proof of the awareness by the decision-makers, of the importance of this field for the health condition of the population and, implicitly for economy.

6. THE IMPACT OF THE ECONOMY ON HEALTH

According to world standards, European societies are prosperous places to live. They have the highest levels of social protection in the world and are at the forefront of welfare, human development and quality of life. In Europe, social realities differ greatly, depending on the environment in which we live and work. Education and health, employment patterns, wages, incomes and healthcare systems still differ greatly. Looking ahead, all Member States are undergoing rapid and profound changes: from an aging population, to the rapid pace of digitalization, to new forms of work and to the effects of globalization and urbanization.

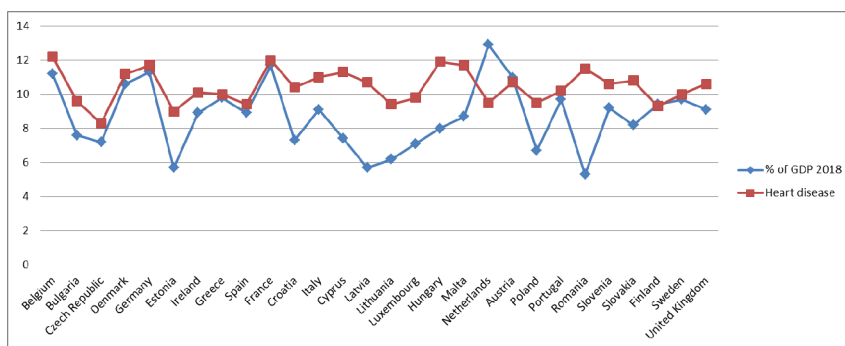
Although funding is important, it will be impossible to get close to universal coverage if people have financial difficulties or are discouraged from accessing health care because they have to pay extra. When this happens, the company bears all the financial risks associated with paying for care. Removing

financial barriers from direct payment systems will help poorer people receive care, although this cannot be guaranteed. Moreover, if the services are not available at all or are not available nearby, people cannot use them even if they are free.

In order to highlight the influence of the economy on the health of the population, we analyzed, using secondary data, a variable, namely the percentage of patients with cardiovascular disease, which we correlated with the percentage of GDP allocated to the health sector to compare Romania with EU member states. We have chosen these indicators as they are the most common diseases at European level and have the greatest impact on life expectancy; also, being chronic diseases, they are among the most expensive in terms of treatment as well as recovery of patients.

According to the analyzed data (Figure 1) it is visible that the percentage of GDP allocated to the health sector influences, to a certain extent, this type of diseases. In most cases, the higher percentage of GDP allocated to health leads to a lower number of people suffering from cardiovascular diseases. This can be explained by investments in prevention programs, access to specialized consultation. Cardiovascular diseases are not only influenced by the financing of the health sector, but there are a multitude of other factors that contribute to their development, but access to health services and the way they receive care significantly contribute to improving or worsening the situation. The financial resources within this sector contribute, to a large extent, to the improvement of the diseases, through the possibility of patients for free treatment, for specialist consultation, recovery.

Figure 1. The correlation between the percentage of GDP allocated to the health sector and patients with cardiovascular diseases, in 2018



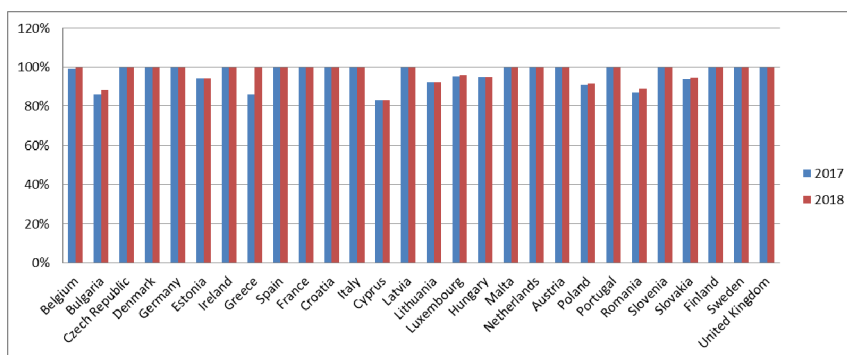
Source: the authors, based on data from Eurostat (2020)

The share of GDP allocated to the health sector is important in reducing any type of disease, as prevention and information programs for the population can lead to the prevention of many types of disease. In this sense, it is necessary to

cover as widely as possible the population with health services, in order to encourage the access and usefulness of the benefits of the sector.

The financial resources allocated to health represent a set of priorities and directions of development in this field, which aim to strengthen the health of the population, achieve adequate living standards and create optimal conditions for maximizing the health potential of each person throughout life. Of course, these goals are valid for all countries in general, and each country, depending on its own level of development, will implement them.

Figure 2. Coverage of the population with basic health services



Source: the authors, based on data from Eurostat (2020)

Figure 2 shows the coverage of the population with basic health services in the EU member states. Although there are countries that allocate a substantial percentage of GDP to the health sector, there are still few that can cover 100% of the needs of the population in this segment. The Czech Republic, Denmark, Germany, Ireland, Croatia, and Portugal are among the countries that cover the population with basic health services. At the opposite pole are Bulgaria (86.0% in 2017 and 88.2% in 2018), Romania (87.0% in 2017 and 89.0% in 2018), Cyprus (83.0% in both years studied).

7. THE IMPACT OF HEALTH ON THE ECONOMY

The economic costs of diseases, regardless of their type, are astonishingly high. The disease reduces the company's annual income, the income of individuals and the prospects for economic growth. The losses are tens of percent of the GDP of the poorest countries, every year, which translates into hundreds of billions of dollars. In developing countries, communicable diseases, mortality and malnutrition have affected the poor far more than the rich, although society as a whole suffers.

The burden of disease is much greater on the population of less developed countries. First of all, it is more prone to diseases due to lack of access to drinking water and sewage, safe housing, medical care, information on

preventive behavior and adequate nutrition. Second, this segment of the population is much less likely to seek medical care even when it is urgently needed, due to the greater distance to health care providers, the lack of own resources needed to cover expenses, and the lack of their knowledge of the most appropriate way to respond to an episode of illness. Third, out-of-pocket spending on serious illnesses can push them into the trap of poverty, spreading to the next generation, as children are forced to leave school and work. Macroeconomic evidence confirms that countries with the poorest health and education conditions find it much harder to achieve sustained economic growth than countries with better health and education conditions.

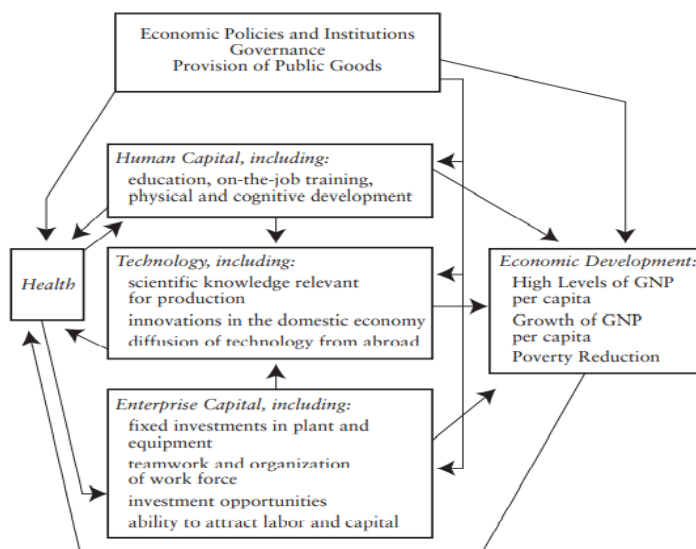
The correlation between better health and higher economic growth is present in works such as those of Fuchs (1966), Barro and Sala-i-Martin (1995), Bhargava *et al.* (2001), Bloom, Canning and Sevilla (2001), Acemoglu and Johnson (2007) etc. Standard macroeconomic analyzes of cross-border economic growth are based on a model in which economic growth over time is a function of initial income, economic policy variables and other structural features of the economy, including indicators of population health. A typical statistical estimate suggests that every 10% improvement in life expectancy at birth is associated with economic growth of at least 0.3 to 0.4 percentage points per year, while other growth factors remain constant (WHO Commission on Macroeconomics and Health & World Health Organization., 2001, p. 24). In short, health seems to explain an important part of the difference between growth rates, even by standard macroeconomic variables. At present, health has particularly detrimental effects on economic development in sub-Saharan Africa, which has experienced a chronic decline in living standards over the last generation, South Asia and other areas of severe poverty.

Because the sickness has such a major economic impact, investing in health is a crucial part of any overall development strategy. This is especially true in developing nations with a high disease burden. However, health-care spending should be done as part of a comprehensive development plan. Not just healthy individuals, but also education and other complementary inputs are required for economic progress. We do not propose that investing in health can solve development problems; rather, we argue that investing in health should be a fundamental part of an overall development and poverty-reduction strategy since their longer time horizon allows for more years to reap the benefits of such investments.

Global public health improved to unprecedented levels in the second half of the twentieth century. Between 1960 and 1995, life expectancy in low-income countries improved by 22 years, as opposed to 8 years in developed countries. Overall, the under-five mortality rate fell from 150,000 live births in the 1950s to 40,000 live births in the 1990s. These health gains were a natural consequence of economic development. This rather reflects the power of healthcare and

related investments. Over the past three decades, various immunization campaigns and child survival strategies have increased the number of children protected by the roots of common childhood infections by millions. Mortality has also declined among non-smokers. Both gains were aided by other factors, including the spread of education. These gains show the effectiveness of well-targeted investments in health and support all economic and health achievements.

Figure 3. Health as an Input into Economic Development



Source: (Sachs, 2001, p. 26)

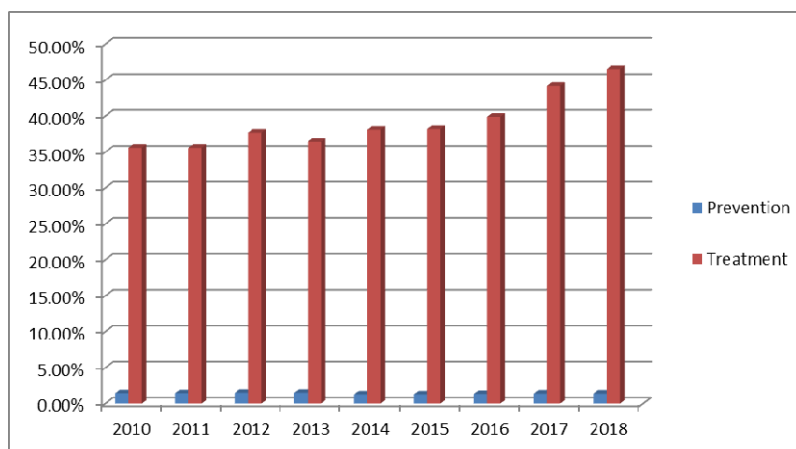
Figure 3 shows the contribution of health, along with the many factors that support economic development. Economic output is shown to be the function of policies and institutions (economic policies, governance and the supply of public goods), on the one hand, and input factors (human capital, technology and enterprise capital), on the other. Policies and institutions are extremely important: they help to determine both the economic performance for any given level of capital and technology, and the rate at which capital and technology are accumulating. Health has the most important economic effects on human capital and the capital of the enterprise. Health itself is affected by dominant policies and institutions, the level of human capital (since education, for example, promotes health), the level of technology in society, especially in the health sector itself, and the increase in income and poverty reduction generated by better health.

As a result, economic development is a multi-sectoral process, and economic development strategies must take into account a wide variety of social

and investment challenges. Health promotion is a promising mechanism for poverty reduction in low-income and developing nations through a more complete development plan. For all of these reasons, health improvements should be taken into account in the context of poverty reduction. Heart disease is among the most widespread in the world, but it is not the only health problem that affects less developed countries. Therefore, we focus on the conditions associated with the highest excess mortality in poor versus rich countries, and these conditions mainly affect the poor in low-income countries.

Between 2010 and 2018 (Figure 4), expenditures on the treatment of heart disease increased visibly, while the costs of prevention varied insignificantly. The cost of treatment increased from 35.6% in 2010 to 37.7% in 2012, and in 2013 it decreased to 36.4% of total current health expenditures. In 2014, the share of these expenditures increased by 1.7 percentage points compared to the previous year, in 2015 it was 38.2%, and in 2016 it reached 39.9% of the total current expenditures allocated to care health. In 2017, the cost of treatment of these diseases increased by 4.3%, representing 44.2% of current expenditures, and in 2018, the share of the cost of treatment reached 46.5% of total expenditures for this segment.

Figure 4. Expenditures on the treatment and prevention of heart diseases in Romania



Source: the authors, based on data from Eurostat (2020)

Prevention and treatment are both costly. Identifying the costs of health treatments necessitates simulating their economic implications. Although intangible, these expenses are the most significant difference between the economies of countries with healthy populations and countries with unhealthy populations. Such issues need to be experienced in order to be measured and evaluated, so that decision-makers in this regard consider that the investment

will be recovered. Moreover, the "losses" suffered by society as a result of the impact of diseases and treatments are also intangible and refer to the integration of people into normal activities, such as work, internal responsibilities and social and leisure commitments, the impact on quality. of life.

8. CONCLUSIONS

Health is one of the issues that will progressively shape the future of our economy and societies. To help support this, all countries, regardless of their wealth level, can adopt actions to improve health services based on an assessment of the costs and anticipated impact of potential solutions. Even before the emergence of some of the most powerful health interventions of the twentieth century, such as immunizations and antibiotics, life expectancy began to rise and mortality to decline in Western Europe and North America. These gains were made possible by improvements in what Fogel (1997) referred to as 'health infrastructure,' such as improved access to safe drinking water, sewerage, and landfill services, as well as other safety measures in food preparation and storage, in particular, as a result of improved agricultural technology and productivity.

Financial resources in the healthcare sector are a problem that is both difficult and difficult to solve. The costs of this system are rising at a rapid pace, which is a problem even for developed countries.

The choice of funding system, as well as reimbursement and payment mechanisms, are important determinants for the right to health care to materialize in equity, quality, and affordability, such as (1) the collection of financial resources, (2) the management of transparency and efficiency available resources, (3) prioritizing population health, (4) developing programs for the prevention of certain diseases, and so on. As a result, financial structures must encourage cost-effective healthcare. It is necessary for the health system's financing to be efficient through the ability to manage existing funds, in order to ensure that patients' requests are met, the safety and quality of the care process is improved, progressive technologies are purchased, and existing disparities in access to these services are reduced.

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THE INFLUENCE OF THE ESTABLISHMENT OF THE ROMANIAN DIGITIZATION AUTHORITY IN THE PROCESS OF DIGITIZING THE LOCAL AUTHORITIES

IOANA-MARINELA TURTĂ (GAVRILUȚĂ)

*Alexandru Ioan Cuza University of Iași
Iași, România
gavrilutaioana@yahoo.com*

MATEI-ANDREI CRISTIAN

*Alexandru Ioan Cuza University of Iași
Iași, România
mateiandrei135@gmail.com*

MARIA-SIMONA CUCIUREANU

*Association Euroregion Siret-Prut-Nistru
Iași, România
cuciureanu.simona87@gmail.com*

GRIGORE NEPOTU

*Alexandru Ioan Cuza University of Iași
Iași, România
raj.grigorenepotu@gmail.com*

Abstract

The digitalisation of public services is the main global reform in the 21st century. The COVID-19 pandemic highlighted in Romania the need to digitize all public services in the shortest possible time, the stage until 2020 being incipient. Thus, the central authorities (Government of Romania) set up the Authority for the Digitization of Romania to support the digitization of public services in the country. The digitization of public services in a broad sense does not only refer to the connectivity of households to the Internet, but also to the platforms provided by public institutions to contribute to the opportunity for citizens to use them to stop interacting physically with civil servants. The study aims to highlight the purpose and role of the Romanian Digitization Authority and how public institutions have evolved in the digitization process from 2020 to the present. Romania faces two main problems in terms of digitization, one is related to educating citizens to use the tools / platforms provided by public authorities to use them in order to minimize the efforts of citizens in solving various problems (payment of taxes, complaining about situations in the community, issuing a tax certificate, etc.), and another is about developing platforms / tools in public institutions to support the community. Digitization highlights the interaction between the state and the citizen, and

the institution created in Romania in 2020 aims to increase the percentage of this interaction.

Keywords: *digitization; public institutions; Romanian Digitization Authority.*

JEL Classification: D02, E02, L38

1. INTRODUCTION

The need to digitize public institutions stems from the fact that citizens have to wait for public services at the counters. They have access to the internet, they use the mobile internet, but they also need an education to use the existing platforms that offer the possibility to use them for public services. Thus, two priorities can now be identified: one on the digitization of public services by transferring them to online platforms and the second priority is on educating citizens to use the Internet to access public services, where there are platforms. The evolution of society determines the reform of public institutions in the sense of digitizing their services. The period during the COVID-19 pandemic accentuated this aspect, that is why the Romanian Authority for the Digitization Authority was established. At the time of its establishment, it was stated that the digital transformation represents a new vision in the public sector, which this institution wants to translate from the business environment. The benefits of digital transformation are many, including efficiency, transparency and simplicity, and lead to much higher process productivity. Romanian society must be aware of the need for new technologies by the leaders of public institutions, of continuous adaptation to the requirements of citizens, quality online services, safe and fast, and the newly established institution has created its vision based on these issues.

Romania's digitalization represents the transition to a new paradigm, technological, informational and social. Public institutions are just one of the key components of the digital transformation process. The private sector, the associative environment, the health environment, the educational environment or the local communities need a process of digitization, which means a comprehensive reform of society. The COVID-19 pandemic highlighted the need for digitization in general, but especially in public institutions, when physical interactions between citizens were limited or restricted.

At European level, the European Commission is monitoring indicators of digital public services in the European Union to ensure that citizens and governments have access to the full potential of this technology. Digital technologies are increasingly imposing new requirements and expectations on the public sector. At European level, e-government can provide a wide range of benefits, including greater efficiency and savings for governments and businesses. It can also increase transparency and openness. This dimension measures both the demand side and the supply of digital public services, as well as open data (European Commission, 2021a). The digital decade aims for all key public services for businesses and citizens to be fully online by 2030. For

example, the DESI index shows that in 2019 there were 60% of users for e-governance, while in 2021 there were 64%. The best performing countries in terms of digitization of public institutions are Estonia, Denmark and Finland, while Romania, Greece and Hungary are the least digitized.

Starting with 2020, Romania is making efforts to recover the gap of lack of digitization in public institutions through the collaboration of several entities, such as the Digital Advisory Council Romania, the National Institute for Research and Development in Informatics and the Romanian Digitization Authority. Digital Romania Consulting Council aims to strengthen the development of the information society in Romania, while the National Institute for Research and Development in Informatics (ICI) is the main research institute in the field of ICT, with activities related to e-government coordination, including the application research projects developed by national authorities and programs funded by EU funds, monitoring and auditing of scientific and technical activities for the implementation of ICT projects, evaluation of online services.

The Romanian Digitization Authority (ADR) aims to provide e-government services by implementing information and communication systems at the national level. This institution is responsible for the operation of the eGovernment portal, the Electronic Public Procurement System, the Virtual Payment (one-stop shop) and the IT system for the electronic award of international authorizations for the transport of goods. ADR must also implement the Single Point of Contact project, which seeks to make the public administration more efficient by simplifying the procedures applicable to services and service providers in order to achieve an interoperable platform at national and European level.

The paper will analyze the projects that have been completed by the Romanian Digitization Authority from 2020 to the present, ongoing projects and proposed projects to digitize public institutions or support the digitization process. The aim of the paper is to highlight whether with the establishment of this institution the number of platforms that help to digitize public services has increased, and this aspect is also found in official statistics.

2. LITERATURE REVIEW

Communication within institutions is important in the digital age, and this aspect is representative for all areas (economic, administrative) (Lindh and Nordman, 2018). In economics, marketing has an important role for services, digitalization being designed to develop collaborative structures between those involved in business (Li, Merenda and Venkatachalam, 2009; Makkonen and Vuori, 2014).

Research has been done to show how important digitization is for companies and their need to use information technology for business efficiency

(Stump and Sriram, 1997; Ryssel, Ritter and Gemünden, 2004; Ekman, Erixon and Thilenius, 2014; Makkonen and Vuori, 2014).

There is pressure in Central and Eastern Europe (CEE) to increase efficiency, comply with regulations and ensure national security, but above all it must respond to the growing demand of citizens for citizen-centered public services. The digital transformation offers CEE governments the opportunity to meet citizens' aspirations for open, transparent and responsive governments.

The influence of technology in various fields makes its presence felt worldwide. The economy, public administration and society are influenced by technological changes. Digitization of public services provides efficiency, which is being developed in some European countries (Androniceanu, Georgescu and Kinnunen, 2022). Digital transformations highlight the modernization of society and show several advantages, including transparency, quality of public services and efficiency of services. Modernization of public administration and services as a result of the integration of information and communication technologies is essential and should become an ongoing concern of state governments (Mansell, 2012). In the countries where these changes have taken place, it has proven to be an effective way to reduce corruption (Mouna, Nedra and Khairredine, 2020). Digitization of public institutions increases the level of efficiency and transparency and should be one of the key pillars of the development of any smart community (Vogelsang, 2010; Șandor, 2018).

Through digitization, the entire activity of public institutions is streamlined on all three levels: internal, intra-institutional and external (Afonasova *et al.*, 2019). Digitization increases transparency and accountability to citizens of the authorities (Balzer, Užík and Glova 2020). Transparency and openness of public institutions are essential for a democratic society. The literature notes that an important role for digitalisation is in reducing corruption, and at EU level it is the best in the world in reducing corruption in recent years, the costs of corruption for the EU economy are estimated at EUR 120 billion per year (European Commission, 2021a). Corruption deepens social inequalities, reduces trust in the state, institutions, and public administration (Çera *et al.*, 2019).

Digitization contributes to the modernization of society, the economy and the transformation of state institutions (Bennett and Segerberg, 2013). Digital transformation also refers to the adaptation of people to accept and use digital equipment and technology for interaction with public institutions (Androniceanu, Sabie and Pegulescu, 2020). The digital transformation of the public sector has implications in all branches of society, from jobs, education, health and social security, including legislative reforms (Karpf, 2012; Gray-Hawkins and Lăzăroiu, 2020). The digitalization of public institutions represents e-government, which is a process of reinventing the public sector using technology, increasing the political participation of citizens and streamlining the administrative apparatus (Coursey and Norris, 2008; Ionescu, 2020).

Digitization of public administration reduces the bureaucracy of public structures (Makowski, 2017; Shkarlet *et al.*, 2020). The digital transformation of public institutions contributes to increasing accessibility, transparency and efficiency and reducing bureaucracy and corruption (Androniceanu, Georgescu and Kinnunen, 2022). Public institutions can be fundamentally transformed by digitization. However, the public sector must also take into account the risks posed by digitization (Gundhus, Rønn and Fyfe, 2018). One of the risks of digitalization is the lack of professionals, and another refers to security (Pūraitė, Adamonienė and Žemeckė, 2020).

Digitization is a hotly debated topic in recent years, in 2015 the United Nations General Assembly approved the 2030 Agenda for Sustainability and Development which, among other objectives, aims at goal number 9 “build resilient infrastructure, promote industrialization inclusive and sustainable and encourage innovation”, taking into account the digital transformation in all sectors. The European Digital Agenda highlights the significant impact of digitalisation on growth and job creation in the economy. In 2017, the European Commission launched the document “Digital4Development: integrating digital technologies and services into the development policy of the European Union”, in which it acknowledged that technologies and services enable sustainable development and inclusive growth (European Commission, 2017). At European level, it is mentioned that for digitalisation, in a complex sense, it is important to develop the right infrastructure, as well as to increase the digital literacy and skills of all sections of society. Digitization is the solution for sustainable development, increasing efficiency in relation to public institutions (Gundhus, Rønn and Fyfe, 2018).

3. MATERIAL AND METHOD

The study first analyzes completed projects, in implementation and in progress of the Romanian Digitization Authority, then will highlight the results promoted by the Romanian Digitization Authority in the period 2020 - 2021 through the reports and indicators (<https://www.adr.gov.ro/rapoarte/>), which highlights an overview of the digitalization of public institutions in Romania and the evolution between 2020 and 2021, following the interaction population with institutions. The analyzed indicators are:

- ✓ Internet use: interaction with public authorities (last 12 months);
- ✓ Internet use: obtaining information from public authorities' web sites (last 12 months);
- ✓ Internet use: downloading official forms (last 12 months);
- ✓ Internet use: submitting completed forms (last 12 months).

The study is a radiography of the state of use of the Internet by people in interaction with public institutions in 2020 and the evolution over two years in Romania. The Romanian Digitization Authority will help create the necessary infrastructure to be able to provide public services online, and the pandemic

context has contributed to the understanding of the population to use these services, if they exist. The quantifications and evolutions of both the development of digital infrastructure within institutions to provide online services through the support of the Romanian Digitization Authority, and the increase in the number of people using the Internet in interaction with public institutions will be highlighted in the coming years. could perform an ante-pandemic and post-pandemic analysis, but in which they would have been analyzed for at least five years, for a more accurate picture.

4. RESULTS AND DISCUSSIONS

At the national level there is the National Authority for Management and Regulation in Communications (ANCOM), which is the only policy administrator in the field of electronic communications and IT. It has assumed the role of national administration of the top-level domain (TLD), '.ro' and the Level II Domain (SLD), '.eu', for the domain names reserved for Romania (European Commission, 2021a). Also, the Association of Electronic Payments in Romania (APERRO) in 2021 had 31 members who made electronic payments in the country. It was launched in 2010, in cooperation with the Agency for the Digital Agenda of Romania and the Information System for Online Tax Payment, in order to assist taxpayers in making their transactions quickly and at a minimum cost (European Commission, 2021a).

It can be seen that there is an incipient stage for the digitalization of Romania due to the objectives and strategic documents established at European level, for the members of the European Union, such as the Digital Agenda. In 2020, the Romanian Digitization Authority was established and is the main body responsible for interoperability activities in the country. The role of ADR is also to increase the capacity of Romanian public institutions and authorities to develop and implement e-government solutions around life events, representing a number of important public services in the lives of citizens and private legal entities.

An important indicator for highlighting the interaction of the population in the last 12 months with public authorities is "e-Government users". At EU level the indicator is constantly improving, it measures the coverage of the volume of interaction of citizens with public authorities online, previously it only referred to the measurement of the percentage of citizens who submit forms through online means. Denmark, Finland and the Netherlands performed very well on this indicator, with over 90% of internet users (aged 16-74) interacting with public administration by choosing government portals. Romania, Bulgaria and Italy had lower results on this indicator were the only three countries in which the percentage of citizens interacting with public administrations was less than 40%.

For the digitization of public services, two important projects took place in Romania "Establishing the framework for the development of e-government

tools (EGOV)" and "Support for the identification, management and implementation of MCSI projects funded under Axis 2 POC 2014-2020". The project "Establishing the framework for the development of e-government tools (EGOV)" - took place between April 4, 2016 - June 3, 2021, the 2016 financing contract was signed by the Ministry of Communications and Information Society (MCSI) and the Ministry of Development Regional Development and Public Administration (MRDPA) at that time. On the website <https://www.adr.gov.ro/> regarding this project it is mentioned that the project was implemented by the General Secretariat of the Government (SGG), while the Authority for the Digitization of Romania was the partnership leader and beneficiary. The project was funded through the European Social Fund, the Operational Program Administrative Capacity (POCA) "Competence makes the difference!", And its aim was to develop the institutional capacity of public authorities to develop e-government tools for citizens and business, as well as ensuring the vision and directions of action in the field of e-government. On June 3, 2021, once the project was completed, the Public Policy in the field of e-government was adopted. The main results of the project were:

- ✓ Elaboration of the unitary legislative framework for the implementation and management of eGovernment services, which will include the roles, responsibilities, methodological norms and organization of the institutions involved;
- ✓ Creating a National Catalog of IT Solutions for e-Government;
- ✓ Analysis of the operational, procedural and informational framework (IT infrastructure) that supports electronic public services, as a whole;
- ✓ Report on the proposal of new institutional, organizational, legislative, informational and training resources for human resources in public administration.

The second important project was "Support for the identification, management and implementation of MCSI projects funded under Axis 2 POC 2014-2020", the financing contract being signed by the Ministry of Communications and Information Society (MCSI) and the Ministry of European Funds (MFE), from that moment. The Authority for Digitalization of Romania was the main beneficiary of the project, which took place between May 20, 2016 - March 7, 2017. The project was funded by the European Regional Development Fund (ERDF), through the Technical Assistance Operational Program 2014-2020. The purpose of the project was to provide the necessary support to the Romanian Digitization Authority in achieving the objectives of the Digital Agenda for Romania 2020 Strategy.

With the establishment of ADR in 2020 as an institution, the Centralized Software Platform for Digital Identification (PSCID) and the Technological Interoperability System with EU Member States (SITUE) projects were unblocked, as well as the delivery of solutions that represent unique interventions so far in digitization. Romania: National Catalog of Public

Services, National Interoperability System, Electronic School Catalog, Specifications for the Digital Transformation of Public Administration.

Table 1 below briefly presents information about the projects that ADR intends to implement or are in the process of implementing. These projects are funded through the European Regional Development Fund through the Competitiveness Operational Program 2014-2020, Priority Axis 2 - Information and Communication Technology (ICT) for a competitive digital economy, Strengthening and ensuring the interoperability of IT systems dedicated to eGovernment services type 2.0 focused on events in the lives of citizens and businesses, the development of government cloud computing and social media communication, Open Data and Big Data.

Table 1. Projects under implementation for the digitization of public services in Romania

No. crt.	Project title	Expected results	Implementation period
1	Computer System for Clinical Records of A.T.I. (S.I.E.C.- A.T.I.)	Modern computer system for monitoring, documentation, exchange of medical data in emergency situations, consultation and / or granting of the second remote notice and support of the processes related to the activities of anesthesia and intensive care (ATI), computer system that will functioned as a support for decision-making in emergency situations in a central unit within the Ministry of Health. Equipping 18 hospitals with identical computer systems, specific to ATI departments and operating rooms (924 ATI and SO stations), interoperable with existing clinical medical systems in the respective medical units, to ensure the analysis, synchronization and integration of patient data.	05.05.2021 – 31.12.2023
2	MMPS service HUB - SII MMPS	An integrated computer system, necessary for the integration, correlation and optimal management of all information in specific fields of activity MMPS correlated with specific life events, so that the interaction of the citizen, both directly with MMPS and with the institutions under the coordination of MMPS, can be realized in the online environment through a single point of contact - the MMPS portal.	29.04.2021 – 28.12.2023
3	Computer system for health records - RegIntermed	Creating a computer system for health records.	22.12.202 (36 months)
4	Strategic framework for the adoption and	National strategic framework for the period 2021 - 2027, developed to strengthen the	03.12.2020 (36 months)

No. crt.	Project title	Expected results	Implementation period
	use of innovative technologies in public administration 2021 - 2027 - solutions for business efficiency	administrative capacity (of the central public administration) in the field of deep tech technologies. Updated legislative framework, associated with blockchain technologies, artificial intelligence, EOSC, EuroHPC and PRACE. National strategic framework and funding instruments for Romania's participation in the European Open Science Cloud (EOSC), European High-Performance Computing (EuroHPC) and Partnership for Advanced Computing in Europe.	
5	Centralized Digital Identification Software Platform - PSCID	Centralized Digital Identification Software Platform (PSCID) to provide the gateway and first security point for electronic eGovernment services.	01.09.2020 – 31.08.2023
6	National Information System for Adoption	Implementation of level 4 sophistication for electronic services aimed at the life event "Adoption", creation of a unified data model and a Romanian contextual vocabulary specific to the field.	30.12.2019 – 31.12.2022
7	Integrated Information System for Issuing Civil Status Documents – SIIEASC	Computerization of civil status flows and ensuring the access of public institutions authorized by law to the data / information from SIIEASC; Design, implementation and operationalization of the access subsystem to the services provided by SIIEASC; Establishment of the electronic archive with the civil status documents drawn up in the last 100 years; Acquisition of 42 mobile counters for the endowment of the county directorates.	25.06.2018 (28 months)
8	National Disability Management System	Centralized national platform for the collection, storage and distribution of information on cases of persons with disabilities (adults and children with certificates of degree and type of disability or who are at the first assessment of obtaining the certificate) to central and local public authorities, individual beneficiaries and institutional partners.	11.07.2019 – 11.06.2021
9	Interoperability Solutions for European Public Administrations (ISA 1 & ISA 2)	Partial or full standardization of existing interoperability solutions.	2016 - 2020
1	Improving the rules, procedures and mechanisms	The creation of two mechanisms, one for coordination between MCSI and the institutions involved in e-commerce as well	04.04.2016 – 04.02.2019

CHALLENGES OF POST-PANDEMIC RECOVERY

No. crt.	Project title	Expected results	Implementation period
	necessary for the Romanian Digitization Authority in order to further develop the e-commerce sector (ECOM)	as a second one for a cooperation mechanism with stakeholders.	
1	Integrated management system for a high-performance information society (SIMSIP)	Unitary quality and performance management systems implemented in central public authorities and institutions.	10.05.2018 (26 months)
1	Technological interoperability system with EU Member States	A needs analysis that will consider integration solutions with PKI Bridge and eIDAS nodes in other EU Member States, as well as the IT systems with which electronic service providers and electronic identity providers operate; Arranging data rooms, designing the IT solution, delivering, installing and commissioning HW equipment and providing software licenses, developing and testing the application, and training users and system administrators.	29.05.201 (38 months)

Source: Romanian Digitization Authority (<https://www.adr.gov.ro/proiecte-in-implementare/>)

There is a concern to digitize public services in Romania, in the context in which this reform can be easy due to European non-reimbursable funds. From the activity reports can be summarized some interesting aspects about the evolution of the digitization of public services. The information highlighting the ADR activity from February to December 2020 and the last activity report, the third quarter of 2021 (July - September 2021) were analyzed in detail.

In 2020, due to the COVID-19 pandemic and the restrictions on the territory of Romania to combat this pandemic, several decisions were taken that forced the institutions to start the digitization process. For example, Emergency Ordinance no. 38 of March 30, 2020 issued by the Romanian Government referred to the use of electronic documents at the level of public authorities and institutions. Thus, the framework for the use of electronic signatures was created and public institutions had the legal framework to accept documents in electronic format from citizens and companies and respond to requests also received in electronic format. The platform ici.gov.ro was launched in April 2020, to facilitate access to government support programs for people affected by the pandemic. The goal was for Romanians to no longer have to go to the

counters and interact with electronic state institutions, the platform is like an online registry, in which communication is done only digitally.

The National Electronic Online Payment System (SNEP or Ghișeul.ro) has been provided with an upgraded regulatory base, which has allowed the integration of all public, local and central services, as well as the acceptance of payments from legal entities. In 2020, over 60 new types of payments were introduced, which will determine a more intense use of this platform, which was observed in 2021. The main changes of the Ghișeul.ro platform in 2020, according to ADR were:

- ✓ Opening of the platform and for payments made by legal entities;
- ✓ Opening the platform to private providers of public utilities;
- ✓ Integration of all types of payments related to the provision of any public service, including community services of public utility;
- ✓ Interconnection with the Virtual Private Space of ANAF - since the interconnection of the Virtual Private Space with Ghișeul.ro, over 36,000 transactions have been made and over 8.8 million lei have been collected;
- ✓ Adding payments for the most frequently requested public services: driving licenses, passport issuance fees, temporary driving licenses, registration certificate;
- ✓ Possibility to pay all fines, including those provided in military ordinances.

Ghișeul.ro turned 10 years old in September 2021 and is considered the most important digital deliverable of public administration in Romania. Table 2 shows the evolution of the main indicators of the Ghișeul.ro platform for the period January 2020 - September 2021, there is a significant increase in all indicators, from users to institutions enrolled on this platform.

ADR mentions that over 60% of those who accessed the Ghișeul.ro platform to pay for public services, taxes, fines or utilities did so from their mobile phone, which means that the premise was created to develop a dedicated mobile application this platform. The activity report of ADR also mentions the National Catalog of Public Services as an important service for the digitization of the central administration. This catalog aims to perform an x-ray of the public services that the administration delivers to citizens and companies, in order to later identify customized digital solutions that optimize administrative processes, as well as to interconnect these solutions. As of October 21, 2021, the National Catalog of Public Services mentions 2333 of the public services completed by the central public administration institutions (including by subordinated / coordinated / under the authority of central institutions) and 260 central / subordinate institutions / coordinated / under the authority of the central institutions that have so far completed the forms related to public services.

Table 2. The evolution of the main indicators for Ghișeul.ro for January 2020 - September 2021

	Indicator	1 January 2020	1 January 2021	September 2021
Ghișeul.ro	transactions	1.416.226	2.495.734	4.578.755
	enrolled institutions	395	532	942
	use	492.990	768.593	1.086.524
	amounts collected	465.083.467	903.957.277	1.753.971.513

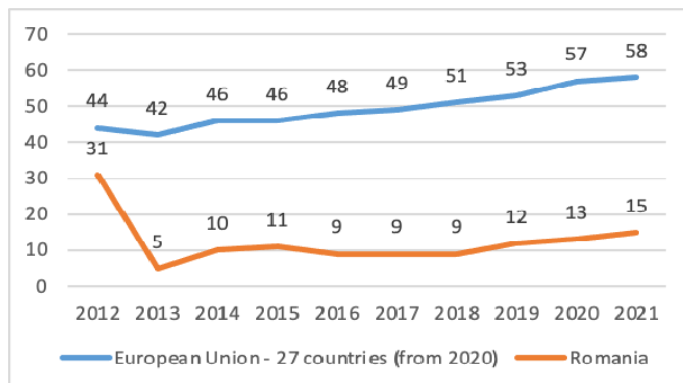
Source: Romanian Digitization Authority (<https://www.adr.gov.ro/rapoarte/>)

Another important platform for the digitization of public services is the Electronic Public Procurement System (SEAP), which has been implemented since April 2, 2018. The process of transparency of public procurement has recorded solid results, with a substantial increase in transmission and publication in the Journal Official Journal of the European Union (OJEU) of notices of initiation or award of contracts / framework agreements for public procurement / sectoral procurement / works or service concessions. In September 2021, there were 201,870 entities in the system, of which 180,000 were economic operators and over 21,000 were contracting authorities.

In the following, the indicators of people who use the Internet to interact with public authorities will be analyzed; obtaining information from public authorities' websites (last 12 months); downloading official forms using the Internet (last 12 months); sending the completed forms using the internet (last 12 months). They are analyzed for the period 2012 - 2021, in order to observe the evolution of 2020 - 2021.

Figure 1 shows the evolution of the use of the Internet by the population in interaction with public authorities (last 12 months) shows that in the Member States of the European Union the percentage of the population has increased from 44% in 2012 to 58% in 2021, while in Romania it decreased between 2012 and 2013, after which it increased from 5% in 2013 to 11% in 2015 and from (%) in 2016 to 15% in 2021. It is observed that in Romania does not have a constant evolution of this indicator until 2015, and the substantial increase is from 2018 from 9% to 2021 from 18%. In comparison with the EU average, Romania has a low percentage of people who use the internet to interact with public authorities.

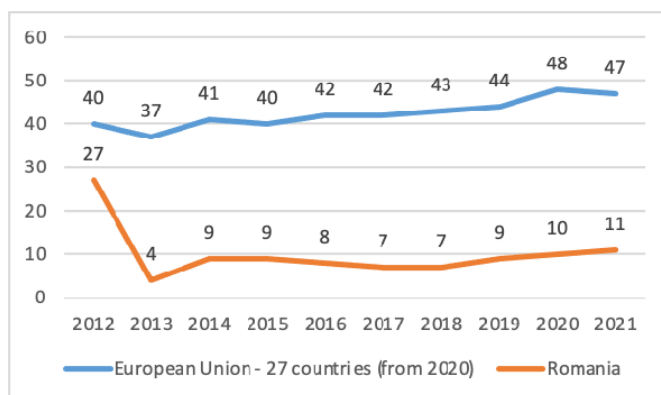
Figure 1. Evolution of the use of the Internet by the population in interaction with public authorities (last 12 months)



Source: (European Commission, 2022)

Figure 2 shows the statistical data for the use of the Internet by the population to obtain information from the websites of public authorities. In Romania the percentage increased from 4% in 2013 to 11% in 2021, while in the European Union it increased from 40% in 2012 to 47% in 2021. It should be noted that in the period 2019 - 2021 in Romania, the percentage of the population that uses the Internet to obtain information from the websites of the institutions increased by 2 percent.

Figure 2. Evolution of the use of the Internet by the population to obtain information from the websites of public authorities (last 12 months)

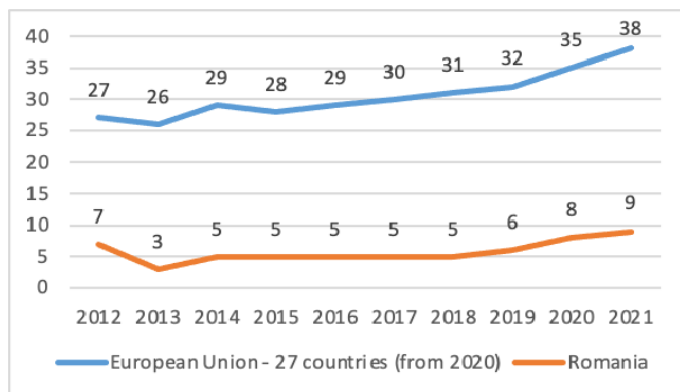


Source: (European Commission, 2022)

Regarding the indicator of the use of the Internet by the population for downloading official forms, in the European Union the percentage of the population increased from 27% in 2012 to 38% in 2021, while in Romania it increased from 3% in 2013 to 9% in 2021 (Figure 3). Between 2019 and 2021

the percentage of the population increased by 3 percent, which means that the pandemic period and restrictions on interaction with the public in public institutions forced the population to use the Internet for this purpose.

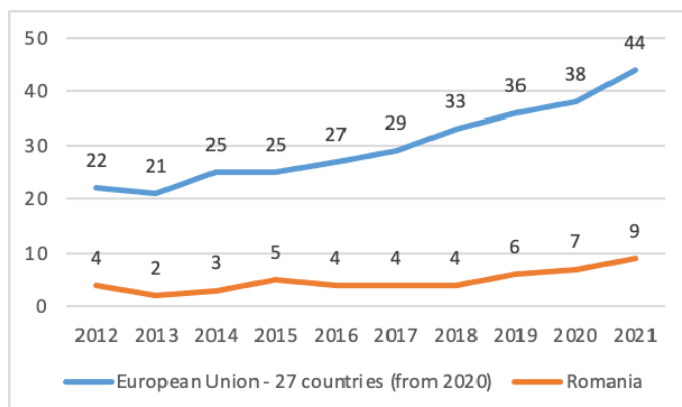
Figure 3. Evolution of the use of the Internet by the population for downloading official forms (last 12 months)



Source: (European Commission, 2022)

The indicator on the use of the Internet for sending completed forms shows an increase in population in the European Union from 22% in 2012 to 44% in 2021, while in Romania the percentage increased from 2% in 2013 to 9% in 2021 (Figure 4). As in the previous indicator, in the period 2019 - 2021 the indicator increased by 3 percent.

Figure 4. Evolution of the use of the Internet by the population for sending completed forms (last 12 months)



Source: (European Commission, 2022)

Following the analysis of the indicators from Figures 1, 2, 3 and 4, it was found that in Romania the percentage of the population for interaction with public authorities is low, below the average of the European Union member states. There has also been an increase in the percentage of the population using the internet for interaction with public institutions, especially in terms of downloading and sending forms, between 2019 and 2021. A low percentage of the population using the internet to interact with public institutions highlights two issues: the lack of information for the public to use the Internet to interact with public services and the inability of institutions to provide digitized services to citizens.

In this context, ADR will play a particularly important role in digitizing public services. It also aims to digitally transform Romania by using the latest technologies. In this sense, a project is being implemented in partnership with the Technical University of Cluj-Napoca, for the development and use of innovative technologies in public administration. The project aims at the main directions of action in areas with an extraordinary development dynamic: AI, Blockchain, High Performance Computing.

5. CONCLUSIONS

Following the study, several important aspects could be observed, among which: the evolution of the population that uses the Internet for interaction with public institutions is at a slow pace between 2013 and 2021 and is at a level of 15% in 2021, compared to 58% for EU member states; the COVID-19 pandemic has stimulated the interaction between citizens and public institutions, due to the cessation of the program with the public, which has led to an increase in the percentage of the population using the Internet to search and submit forms; The establishment of the Romanian Digitization Authority accelerates the process of digitization of public services, both centrally and locally.

The establishment of ADR in 2020 created the institutional framework for the digitization of public services, and the role of this institution could be seen in the analysis of the main indicators of the Ghișeul.ro platform, for online electronic payments, which increased considerably between January 2020 and September 2021. The institution has determined the necessary regulatory clarifications to integrate all public, local and central services. The projects that are being implemented and the perspectives proposed by the ADR management offer the premise for the digitalization of public services. Public institutions need support in the digitization process, and the existence of a dedicated institution will support and encourage this reform. The effects of this institution on the digitization of public services will be seen in the coming years as the population of the Internet for public services grows, a relevant indicator in this regard. The study can be continued through case studies on the institutions that started the reform of digitalization of public services or by deepening the completed projects, in order to highlight the usefulness and importance of the institution.

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DIMENSION OF CORRUPTION PHENOMENON FROM EUROPEAN UNION

IULIANA UNGUREANU

Alexandru Ioan Cuza University of Iași
Iași, Romania
pantea.iulianaa@yahoo.com

Abstract

Over time, there have been doubts about how to measure corruption, as its very nature is largely hidden. The main way of measuring corruption was based on the perception provided by transnational indices that were extracted from a series of surveys and expert assessments. However, it is now widely recognised that such measurements are inherently prone to prejudice and serve as an imperfect proxy for real levels of corruption. At the same time, is appreciated that the intention to measure corruption, especially through the development of transnational data sets with a wide scope of application. In this case, we intend to estimate the corruption phenomenon in the European Union (EU) countries (27 countries) for 2019, based on the corruption perceptions index (CPI) and some independent variables that play an important role on the corruption phenomenon, namely: freedom of expression, level of education, the standard of living, political stability, trust in justice, trust in state institutions, fiscal pressure, soundness of the banking system, religion and fiscal morality. In this context, the research aims not only to develop an econometric model that could reflect truncated truths regarding the elements responsible for corrupt behaviors, but also to corroborate it with a reasoning of good faith and with the foundations already existing in the literature, so that we can manage to identify the determining components that shape the corrupt behavior and with the help of which to estimate the dimension of the corruption phenomenon. The final score obtained will reflect the estimated size of the corruption phenomenon for each analyzed country, and depending on the scores recorded at the country level, a classification will be made that will be divided into 3 zones (green zone – low level of corruption, orange zone – medium level of corruption and red zone – high level of corruption), which will be useful to investors who want to expand their business in other countries in order to compare the corruption phenomenon in his country with that of the country to which it relates.

Keywords: corruption; news; mass media corruption; corruption perceptions index; score; classification.

JEL Classification: D73, D70, C13

1. INTRODUCTION

Considered one of the greatest threats to the democratic ideal, corruption violates social justice, discredits state institutions and undermines economic development (Stapenhurst, Ulrich and Strohal, 2006). Corruption can be defined

as a mechanism by which public services are intentionally used to get personal gain (Jensen, Li and Rahman, 2010). The literature shows that such a phenomenon also has a transnational nature, and there is a fairly strong link between it and the other forms of crime (Dion, 2010; Heckelman and Powell, 2010; Achim and Borlea, 2019; Nişulescu-Ashrafzadeh and Pîrvan, 2019).

Over time, there have been doubts about how to measure corruption (Kaufmann *et al.*, 2007; Heinrich and Hodess, 2011; Heywood, 2014; Villarino, 2021), as its very nature is largely hidden. This is an enigma faced by all those who have tried to develop a method of measuring corruption. Probably the only ones who dispute that corruption is difficult to measure are those who argue that the objective measurement of corruption is "impossible" (Zaman, 2009) or "practically impossible" (Goel and Nelson, 2010) and therefore accepts existing instruments for measuring it.

Given that "... at this point, it would be preferable to test theories about the cause and consequences of corruption using a smaller sample than that used to provide the CPI, but with greater certainty that the data is more valid" (Hawken and Munck, 2009) and that it is "necessary to use more quantitative data sources, narrative analyses and real-life case studies to reproduce a picture of corruption in a country" (Malito, 2014) we will try to estimate the phenomenon of corruption in the European Union (EU) for 2019 on the basis of variables that express its consequences and which have certain foundations.

In this sense, the research focused on the analysis of the corruption phenomenon from its own perspective, based on the research conducted by Schneider (2015), using variables that capture the characteristics of countries and which reflect or are related to the opportunities and incentives for corruption. The author made a ranking of countries, according to the size of the shadow economy, a phenomenon considered much more complex than corruption (Achim, 2017). The originality of the paper is provided by the ability to analyze, proven by removing or adding variables in the methodology proposed by Schneider (2015), which can lead to a close reflection of the reality of the corruption phenomenon.

In the next section, the paper presents the literature review. Section 3 describes the regression analysis. Section 4 presents the methodology used and the proposed hypotheses. Section 5 estimates the dimension of corruption, and the last section summarizes the conclusions of the paper.

2. LITERATURE REVIEW

The emergence and spread of quantitative indicators have been recognized by some authors as a favorable environment, as these indicators had as objective the systematization of working practices that allowed the spread of appropriate attitudes and behaviors (Merry, 2011; Sarfaty, 2015) and also encouraged international non-governmental organisations to start paying more attention to the idea of measuring corruption (Hawken and Munck, 2011).

The explosion of data generated by these measurements has stimulated a new level of academic attention to corruption (Cole, 2015), which in turn has fuelled interest in measurement initiatives and contributed to their methodological improvement (Kaufmann *et al.*, 2007; Transparency International, 2012a). Today, measuring corruption is an industry in itself. A few years ago, Malito (2014) identified thirty initiatives to measure corruption, and Transparency International listed in a 2012 report more than five hundred diagnostic tools, which involve a certain degree of measurement of corruption values (Transparency International, 2012b). Given the developed indicators, there were doubts about the “validity of measurement”, and the existence of a “science of measuring corruption” is considered a (relatively) defined empirical process (Langbein and Knack, 2010).

As such, the “science of measuring corruption” may not be very accurate. Heywood and Rose (2014) went so far as to argue that variations in the results of a corruption indicator are “just as likely to be a product of the methods used to create these measures because they must reflect real levels of corruption”. Their argument is an extreme version of widespread reasoning, namely: when we don't know if the existing methodology is good enough to measure corruption, how do we know if the changes in the indicators used actually reflect the changes in real levels of corruption or something else? (Villarino, 2021). However, other authors argued the exact opposite and specified that the corruption phenomenon is as measurable as other social phenomena (Kaufmann *et al.*, 2007), and there were rather doubts about the use of techniques and their suitability for the intended purpose.

Since the 1990s, the main measure of corruption has been based on the perception provided by transnational indices that have been extracted from a series of expert surveys and assessments. Indices calculated by Transparency International (Corruption Perceptions Index - CPI, Bribe Payers Index - BPI, Global Corruption Barometer - GCB); Business Environment and Enterprise Performance Survey (BEEPS); or other aggregate indicators, such as the Control of Corruption, which is a component of the World Governance Indicators (WGI) provided by the World Bank, have undoubtedly proved to be extremely important in terms of raising awareness of the problem of corruption, allowing the realization of detailed comparisons to be made between countries. However, it is now widely recognised that such measures are inherently prone to prejudice and serve as an imperfect proxy for real levels of corruption (Razafindrakoto and Roubaud 2010; Heywood and Rose 2014; Villarino, 2021).

Considered the most dominant approach to measuring corruption, the CPI provided by *Transparency International* captures information on the administrative and political aspects of corruption (Transparency International, 2012a). Broadly speaking, surveys and evaluations used to compile the index include questions about bribery of civil servants, bribes involved in public

procurement, embezzlement of public funds and questions that analyse the strength and effectiveness of anti-corruption efforts in the public sector.

However, it is subject to much criticism due to both its methodology and its use (Razafindrakoto and Roubaud, 2010; Heywood and Rose, 2014). As the title of the index explains, it measures perceptions rather than, for example, reported cases, prosecutions or proven incidence of corruption. However, this matters because perceptions can influence behavior in significant ways: for example, if we believe that everyone around us is engaging in corrupt behavior, this may make us more likely to adopt such practices or vice versa.

Kaufmann, Kraay and Mastruzzi (2007) deny that corruption cannot be measured. He argues that in reality corruption can be measured in many ways, and the different approaches have different purposes that we should take into account the most. Three broad ways of measuring corruption have been identified. The first refers to the collection of informed views of stakeholders. The second way concerns the institutional characteristics of the countries, and the last way refers to the careful audits of the specific projects.

Hawken and Munck (2009) acknowledged that the task of measuring corruption, in particular by developing transnational datasets with a wide scope of application, is commendable and welcome. The authors note that although the reported levels of corruption may differ from the real levels, the available data should be taken into account and used to generate a better index, of course by carefully considering the methodological options as well. In practice, this would require a narrower empirical scope of application because both indicators and aggregation rules would first be based on rigorous theory and testing.

3. RESEARCH METHODOLOGY AND HYPOTHESES DEVELOPMENT

Considering the purpose of our research, we will try to make use of both available data on perceptions of corruption and the information on the causes and consequences of corruption. The identification and the objective analysis of corruption's representative and determinant elements is our main objective. The research is not limited to the use of certain sets of variables that provide the necessary *outputs* to validate statistical hypotheses, but aims to present reality in its pure form, and econometric modelling shall be considered more as an aid to the study of corruption.

The study has in view the countries in the European Union area (27 countries), as this area is considered by Pappas (2010) and Viana *et al.* (2021) as an exceptional opportunity for corruption research. They consider that there are many differences in institutional factors in Europe, and this is of major interest for the fight against corruption. Data collection was carried out for the year 2019, with a total of 27 observations in the end.

Corruptible behaviour shall be analysed through the corruption perception level in EU countries as provided by the *Transparency International* reports,

which will be the dependent variable (*COR*). In addition, a number of ten independent variables are chosen to play an important role on the phenomenon of corruption, namely: freedom of expression, level of education (years), standard of living, political stability, trust in justice, trust in state institutions, fiscal pressure, banking soundness, religion and fiscal morality. There are several phases in our approach to determine the dimension of corruption. The first phase involves testing the proposed econometric model and validating the hypotheses that relate to the variables under analysis. The choice of some of these variables and the use of this methodology started from the research conducted by the author Schneider (2015), who compiled a ranking of countries according to the size of the underground economy, a phenomenon considered much more complex than corruption (Achim, 2017). In this research, corruptible behaviour is expressed through the Corruption Perception Index since, according to Kaufmann, Kraay and Mastruzzi (2007), it is the only one that allows for large-scale cross-border comparisons and monitoring of corruption over time. According to Chen *et al.* (2018), removing or adding variables in the methodology proposed by Schneider (2015) can lead to a close reflection of reality for certain phenomena that represent forms of economic and financial crime. Thus, based on the study conducted by this author, we keep the following variables: trust in justice, political stability and freedom of expression. The other variables have been added based on the literature specified in the presentation of the hypotheses. For the second phase, a simple linear regression will be run between the dependent variable and each of the independent variables influencing the corruption perception level in order to identify the correlation coefficients (R-Square). The last phase involves some algebraic operations, namely multiplying each correlation coefficient by the values of the corresponding independent variables and adding the values obtained in the previous operation for each independent variable. The final score will reflect the estimated dimension of corruption for each country under analysis. Based on the scores recorded for each country, a classification will be made which will be divided into 3 zones (green zone - low corruption level, orange zone - medium corruption level and red zone - high corruption level) and this could be useful for investors who want to expand their business in other countries in order to compare the corruption level in their country with the one in the country to which they compare. For a better understanding, several tables and maps shall be made available.

The dependent variables involved and the assumptions on which the analyses are based are presented below. This is a first phase in the construction of the equation that will form the basis for estimating the dimension of corruption.

Freedom of expression refers to the freedom of the press, which can point out certain anti-social acts (*FdExp*). According to Persson, Roland and Tabellini (1997), freedom of the press can act to combat corruption as cases of corruption

brought to light are not only punished by law, but also by exclusion of those involved from certain groups or even from public office. Brunetti and Weder (2003) and Sung (2004) argue that a free and independent press is probably one of the most effective institutions for uncovering violations by government officials, and therefore countries, where there is freedom of the press, will have less corruption than those where the press is controlled and censored. Freedom of expression is encouraged by high transparency, which makes people informed and aware of all the events taking place. This awareness should make citizens share, in turn, public information about acts of corruption. In this sense, we can estimate that when the level of freedom of expression is higher, the risk of corruption is lower.

H₁: High level of freedom correlate directly with low corruption level.

The level of education is the variable that refers to the average number of years a person is expected to spend in educational institutions over their lifetime (*LvEd*). Previous research shows that places where education levels are high are considered less corrupt, and where people are more educated corrupt practices are not encouraged. There are authors who believe that individuals with higher education should react differently to corruption compared to those with levels of education, and some believe that the massive involvement of highly educated individuals in fighting corruption is conducive to reducing corruption (Cabelkova, 2000). Continuous training of individuals in the sense of gradually acquiring skills, but especially in shaping behaviour that excludes corruption will strengthen the fight against this phenomenon. Chen, Ding and Kim (2010) conclude that lower corruption levels are related to higher levels of education. In this context, higher average durations are expected to lead to lower corruption levels as the population is more aware of the consequences of corruption.

H₂: Good levels of education correlate directly with the low corruption levels.

Individuals' standard of living (*SdLiv*) reflects the standard of living of a country's population, which refers both to the conditions in which people live and to the road infrastructure or even purchasing power. When the standard of living in a country is higher there will also be better law enforcement, which means that incentives to resort to underground activities will be reduced (Schneider, 2015). Literature shows that the standard of living can be indirectly affected by corruption by undermining economic growth and reducing incentives for investment (Akçay, 2006). Various empirical studies show that corruption influences the resources allocated to education and health. Gupta and Krishnamurti (2018) show that the level of social spending is reduced by this phenomenon, which also encourages income inequality. Other authors (Achim and Borlea, 2019), consider corruption as a poverty-driven weakness that disappears when the country becomes rich. Therefore, for this variable we can have the following working hypothesis:

H₃: High standard of living correlates directly with low corruption levels.

Political stability is the variable that refers to the coherence of the action of each country's political classes (*PolSt*). Any existing loopholes in anti-corruption regulations could be exploited by categories of people who have anti-social views and have demonstrated resourcefulness and skill in certain actions taken (Viana *et al.*, 2021). In this regard, there should be consistency in the legislation on long-term strategies on preventing and combating corruption, and closer monitoring is needed for the categories of people. Political instability can: distort political decision-making, increase political inequalities, generate conflict or even lead to general instability (Alm and Torgler, 2006). Thus, whether we are talking about a totalitarian or a democratic, right-wing, or left-wing regime, the more coherent and consistent long-term policies are, the lower the risk of higher corruption levels.

H₄: The high level of political stability correlates directly with the low corruption level.

Information on public confidence in the law courts and in the actions of their employees is reflected in the variable Confidence in Justice (*ConfJus*). The independence of the judiciary system in relation to the state government ensures a normal functioning of anti-corruption agencies and a lack of political influence (Mungiu-Pippidi, 2013), which ensures a high level of public trust. The existence of a judicial council in charge of self-regulation of magistrates only creates favourable conditions for unethical acts to occur and reduces the citizens' level of trust. Corruption is a complex phenomenon that makes it impossible to find solid incriminating evidence when the exact moment of occurrence is not captured, compared to other forms of economic crime where tangible evidence can be identified (false documents, weapons etc.). However, there is a concrete end to corruption, and in almost all cases it is about large sums of money that individuals cannot justify. In the absence of such evidence, courts are unable to prove or hold the individuals concerned accountable (Argandona, 2003). This also depends on the level of public confidence, i.e., the higher the level of public confidence, the lower the risk of corrupt behaviour in citizens.

H₅: Confidence in justice correlates directly with low corruption levels.

Similarly, the variable trust in state institutions (*TrSi*) reflects the credibility of public officials and refers to trust in the institutions themselves: Parliament, Army, Police etc. The underground economy is associated with loss of trust in state institutions because the activities involved aim to circumvent regulations and can more easily penetrate public institutions (Wallace and Latcheva, 2006). The more trust taxpayers have in public officials, the more likely they are to be honest (Torgler and Schneider, 2009). Mironiuc *et al.* (2021) stated that the quality of institutions (reduced corruption) guarantees high confidence and well-being of the community. If taxpayers notice that many public officials are corrupt or are aware of the presence of acts of corruption, then there will be a perception that the corruption level is high, and trust will be reduced. Thus, when trust in public institutions is high, whether in the courts or in other public

institutions, the risk of corrupt behaviour occurring and manifesting itself should be significantly lower.

H₆: Trust in state institutions correlates directly with low corruption levels.

Also known as the tax burden, fiscal pressure is the most common cause of economic crime (*FiscPrs*). Several authors (Schneider and Klinglmair, 2004; Dreher and Schneider, 2010; McGee, 2012) have highlighted the role of the tax burden on economic crime, noting that a high tax rate can lead to corruption to evade taxes or engage in underground activities. To obtain some private gains (e.g., avoiding taxation or regulation and winning public contracts), entrepreneurs may resort to bribery of public officials (Kaufmann, Kraay and Mastruzzi, 2010). Thus, we expect that the low tax pressure (high tax freedom) will reduce the risk of corrupt behaviour.

H₇: There is a reverse connection between fiscal pressure and low corruption levels.

The banking system that intermediates financial transactions carried out in economic activity, which shows the importance of developing sound banking systems in the prevention and detection of financial crime (*BakS*). There are a number of reasons for the emergence of corruption in the banking system. Firstly, companies can bribe politicians to obtain loans without going through the loan appraisal and analysis stages and banks can bribe politicians to obtain regular forbearance (Park and Blenkinsopp, 2011). In this case, financial resources will be misdirected to inefficient projects, leading to an increase in the volume of non-performing loans. Therefore, a high quality of banking soundness can reduce the risk of engaging in corruption offences.

H₈: Banking soundness correlates directly with low corruption levels.

The level of religiosity is the variable that reflects the symbolic expression of a belief in the existence of an absolute reality on which man depends (*Rel*). There are studies in the literature showing how Orthodox Christianity, Catholicism and Islam (hierarchical religions) support cultural attitudes associated with respect for official authority and social hierarchy. However, individualistic religions, such as Protestantism, which promote economic freedom with less government involvement in the private sector are also presented (Treisman, 2000). In other words, this category of religions is less tolerant of corruption compared to hierarchical religions (Arvante *et al.*, 2009; Ko and Moon, 2014). Religion influences a nation's values and can always be responsible for the spread of corruption (Faleye, 2013). He states in his study that religion is responsible for corruption in the country, and religious leaders should impart doctrines that refer as much as possible to combating this phenomenon. If we look at the CPI ranking provided by *Transparency International*, we can see that the least corrupt countries (New Zealand, Denmark, Finland, Sweden and Norway) are also those with the lowest level of religiosity. In this context, we can take as a working hypothesis that a higher level of religiosity will increase the risk of involvement in corruption.

Underlying this is the idea that those involved in corruption feel the need to atone for their sins and dishonesty through religious activities, so that they have a less burdened conscience.

H₉: There is an inverse relationship between the level of religiosity and the low corruption level.

Tax morality highlights the attitude towards paying taxes, i.e., the motivation of individuals to comply with taxes (*FiscMor*). Lowering tax morality makes individuals inclined to break the law and therefore more likely to cheat (Torgler and Schneider, 2009). A high level of tax morality reduces the incentive to cheat by avoiding taxes and engaging in clandestine work (Alm and Torgler, 2006; Kirchler, 2007). Abed and Gupta (2002) state that the countries with the highest level of tax morality and the highest level of tax compliance are those with high levels of democracy. These countries also encourage social responsibility, which is a mandatory factor that determines the emergence of tax morality (Nichita and Brăncănu, 2012). Thus, the higher the level of tax cheating (low level of fiscal morality), the higher the tendency to commit acts of corruption.

H₁₀: The high level of cheating expressing a lack of fiscal morality is in inverse correlation with the low corruption level.

Estimating the dimension of corruption will allow us to capture human behaviour as clearly and realistically as possible in terms of the appetite for corruption and the specific elements that inhibit it.

The full list of proposed variables and their sources is detailed in Table 1.

Table 1. Description of selected variables

Factors	Variable description	Link	Data source
Dependent variable	- The COR reflects the scale of corruption and it ranges from 0 (very corrupt) to 100 (very clean).	-	<i>Transparency International</i> reports
Independent variables			
Freedom of expression	- FdExp represents the state of the freedom of the press in each country. - it ranges from -2.5 (very weak) to 2.5 (very strong).	Direct	World Bank reports
Level of education	- LvEd reflects the average number of years an individual is expected to spend in educational institutions over their lifetime, ranging from 2 years (low level) to 29 years (high level).	Direct	United Nations reports
Standard of living	- StLiv is a standardised means of measuring levels of the fundamental dimensions of human development, i.e., well-being, ranging from 0 (very	Direct	Human Development Report

Factors	Variable description	Link	Data source
	low) to 1 (very high).		
Political stability	- PolSt shows the stability in political and governmental issues in the countries, ranging between -2.5 (weak) and 2.5 (strong).	Direct	World Bank reports
Confidence in justice	- ConfJus reflects public confidence in the law courts and the actions of their employees, ranging from -2.5 (weak) to 2.5 (strong).	Direct	World Bank reports
Trust in state institutions	- TrSi measures the confidence in the quality of public services, policy formulation, implementation and ranges from -2.5 (weak) to 2.5 (strong).	Direct	World Bank reports
Fiscal pressure	- FiscPrs is reflected by the tax freedom score, ranging between 0 (low) and 1 (high).	Inverse	Heritage Foundation
Banking soundness	- BakS shows the efficiency of the banking system and ranges between 1 (lowest) and 7 (highest).	Direct	Global Competitiveness Report
Level of religiosity	- Rel indicates the importance of religion for each person, i.e., the degree of religiosity, and ranges between 0 (low) and 1 (high).	Inverse	World Value Survey
Fiscal morality	- FiscMor reflects the level of tax morality as measured by cheating on taxes, ranging from 1 (lowest cheating tendency) to 4 (highest cheating tendency).	Inverse	World Value Survey

Source: author's own processing

The general form of the econometric model which includes the dependent variable on the perception of corruption and the ten independent variables can be displayed as follows:

$$COR_i = \beta_0 + \beta_i X_i + \varepsilon_i \quad (1)$$

where: COR_{it} represents the corruption level for country i (ranging from 1 to 27 - countries), β represents the regression coefficients, X represents the independent variables, and ε reflects the probability errors.

The algorithm equation for calculating the score reflecting the dimension of corruption will take the following form:

$$COREI = \sum \beta_x X_i \quad (2)$$

where: COR_{Ei} is the score reflecting the estimated size of the corruption phenomenon for country i , β_x is the correlation coefficients for each variable X (*R-squared*), and X takes the value of the ten independent variables reflecting the value of the factors related to the stated hypotheses.

4. REGRESSION ANALYSIS

For 2019, a multiple regression is performed using the Eviews software. First, the significance of the correlation coefficients will be tested according to the two hypotheses:

$H_0: \beta_i = 0$ (it is not statistically important)

$H_1: \beta_i \neq 0$ (it is statistically important)

where: $i = 1, 2$ and β - slope of regression line

The probabilities of all estimated coefficients are found to be less than 0.05, which means that we reject the null hypothesis and accept the hypothesis that these coefficients are statistically significant with 95% probability. At the same time, we note that the value of the Durbin Watson statistic is greater than 2, which rules out the possibility of a positive serial correlation ($2.232799 > 2$). Thus, we can estimate that 95.05% of the ten variables exert an influence on the corruption phenomenon, the difference up to 100% being explained by the residual component. Also, in Table 2 we can see that, in accordance with the hypotheses established and substantiated by the literature, the dimension of the corruption phenomenon is negatively and significantly associated with fiscal morality, religion and fiscal pressure for the entire period under analysis. At the same time, the results show that the *COR* variable is positively associated with trust in state institutions, trust in justice, freedom of expression, fiscal morality, education level, standard of living and banking soundness.

Table 2. Multiple regression for 2019

Dependent Variable: COR				
Method: Least Squares				
Sample: 1 27				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-12.94422	41.76060	-0.309963	0.1406
FdExp	0.725424	0.220697	3.286969	0.0046
LvEd	0.344203	0.792978	0.434064	0.0200
StLiv	1.968703	58.43114	0.033693	0.0135
PolSt	0.114522	0.089741	0.016145	0.0201
ConfJus	0.327915	0.187789	1.746194	0.0399
TrSi	0.065756	0.174531	0.016756	0.0713
FiscPrs	-0.053684	0.081231	-0.660881	0.0781
BakS	1.703942	1.094375	1.556999	0.0390
Rel	-0.075459	0.071659	-1.053026	0.0080
FiscMor	-6.395627	2.674392	-2.391433	0.0294

R-squared	0.950460	Mean dependent var	63.85185
Adjusted R-squared	0.919498	S.D. dependent var	14.20645
S.E. of regression	4.030790	Akaike info criterion	5.917368
Sum squared resid	259.9563	Schwarz criterion	6.445302
Log likelihood	-68.88447	Hannan-Quinn criter.	6.074351
F-statistic	30.69717	Durbin-Watson stat	2.232799
Prob(F-statistic)	0.000000		

Source: Output Eviews 10.0

Considering the rather large value of the R-squared coefficient (0.888340) we tested the multicollinearity problem so as to eliminate the possibility of correlations between the independent variables.

The variance inflation factor (VIF) test in Table 3 indicates that there is no collinearity between the proposed independent variables because the values are less than 5, and the results will not be statistically biased.

To test the autocorrelation of errors we use the Breusch - Godfrey test for a number of 2 lags, considering the following hypotheses:

H_0 : There is no self-correlation

H_1 : There is self-correlation

In Table 4 we can see that, using the Breuch-Godfrey test, the probabilities of the test statistics exceed 5%, which means that we accept the null hypothesis according to which there is no autocorrelation of the residuals.

Table 3. Variance Inflation Factors Test

Variance Inflation Factors			
Sample: 1 27			
Included observations: 27			
Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	261.1069	2337.541	NA
FdExp	2.602840	147.5738	4.571760
LvEd	0.111324	272.1127	2.363702
StLiv	409.5514	2836.334	4.556864
PolSt	1.684884	10.18052	2.052718
ConfJus	4.272533	60.63534	4.017520
TrSi	2.891343	66.08170	3.552431
FiscPrs	0.001170	49.20108	2.306616
BakS	0.167067	38.24135	1.533689
Rel	0.000665	14.19484	2.094297
FiscMor	1.276052	43.60834	1.316867

Source: Output Eviews 10.0

Table 4. Breusch-Godfrey test for 2019

Breusch-Godfrey Serial Correlation LM Test:				
F-statistic	0.628046	Prob. F(2,14)	0.5480	
Obs*R-squared	2.223014	Prob. Chi-Square(2)	0.3291	
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.77687	46.18936	0.384869	0.7061
FdExp	-0.015140	0.230364	-0.065720	0.9485
LvEd	0.247844	0.845305	0.293200	0.7737
StLiv	-34.28166	67.73532	-0.506112	0.6207
PolSt	-0.005870	0.096410	-0.060883	0.9523
ConfJus	0.147270	0.249714	0.589756	0.5648
TrSi	-0.035580	0.181689	-0.195831	0.8476
FiscPrs	0.007860	0.087034	0.090313	0.9293
BakS	-0.075214	1.257226	-0.059825	0.9531
Rel	0.025846	0.077171	0.334923	0.7426
FiscMor	0.013851	2.766365	0.005007	0.9961
RESID(-1)	-0.221114	0.308797	-0.716050	0.5857
RESID(-2)	-0.352884	0.368968	-0.956408	0.5551

Source: Output Eviews 10.0

For the testing of the homoscedasticity of the equation's residuals, i.e. to check whether they have a constant variance, the White test is carried out, which is based on the regression of the squares of the residuals on the explanatory variables and their squares. We consider the following assumptions:

H_0 : The model is homoscedastic

H_1 : The model is not homoscedastic

The use of the White test shows in Table 5 that Prob (Obs * R-squared) = 0.3190 exceeds the level of 5%, which means that the null hypothesis that the model is homoscedastic is accepted.

Table 5. White Heteroskedasticity test for 2019

Heteroskedasticity Test: White				
F-statistic	1.189272			
Obs*R-squared	11.51209	Prob. Chi-Square(10)	0.3190	
Scaled explained SS	4.194792	Prob. Chi-Square(10)	0.9381	
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-96.21674	71.30376	-1.349392	0.1960
FdExp^2	-0.007285	0.005170	-1.408872	0.1780
LvEd^2	0.050772	0.078324	0.648233	0.5260

StLiv^2	117.4452	108.5104	1.082340	0.2951
PolSt^2	0.002649	0.002061	1.284938	0.2171
ConfJus^2	0.001006	0.004741	0.212176	0.8346
TrSi^2	-0.000723	0.004793	-0.150759	0.8821
FiscPrs^2	-0.000514	0.002058	-0.249917	0.8058
BakS^2	0.913771	0.386575	2.363759	0.0311
Rel^2	0.003635	0.002427	1.498048	0.1536
FiscMor^2	0.546611	2.106681	0.259466	0.7986

Source: Output Eviews 10.0

5. ESTIMATION THE DIMENSION OF CORRUPTION

Running simple linear regressions between the independent and dependent variables provided the values of the correlation coefficients (R Square) that we will apply next on the value of the variables to obtain a final corruption score for each country. The summary representation of the econometric modelling is shown in Table 6.

Table 6. Values of correlation coefficient for independent variables as of 2019

Regression Statistics <i>FdExp</i>		Regres Stat LvEd	Regres Stat StLiv	Regres Stat PolSt	Regres Stat ConfJus
Multiple R	0.927273	0.631845	0.871571	0.413544	0.926896
R Square	0.859835	0.399229	0.759637	0.171019	0.859136
Adjusted R Square	0.854229	0.375198	0.750022	0.13786	0.853502
Standard Error	5.424028	11.22941	7.102912	13.19091	5.437533
Observations	27	27	27	27	27
Regres Stat <i>TrSi</i>		Regres Stat FiscPrs	Regres Stat BakS	Regres Stat Rel	Regres Stat FiscMor
Multiple R	0.883554	0.600923	0.304663	0.508169	0.24227
R Square	0.780668	0.361108	0.237610	0.258236	0.058695
Adjusted R Square	0.771895	0.335552	0.207114	0.228565	0.021043
Standard Error	6.785048	11.5802	13.79905	12.47772	14.05619
Observations	27	27	27	27	27

Source: author's own processing

Running the econometric model reveals that the independent variables that most dominantly influence the dimension of corruption are freedom of expression (*FdExp*) with a coefficient of 0.859835, trust in justice (*ConfJus*) with a coefficient of 0.859136 and trust in state institutions (*TrSi*) with a coefficient of 0.780668. The lowest influence on the corruption phenomenon is recorded by the tax morality variable with a coefficient of 0.058695. From the results obtained we can state that the nature of corruption is less correlated with factors such as fiscal morality, political stability, banking soundness or religion and more strongly correlated with the level of public confidence in justice, trust in state institutions and freedom of expression.

Table 7. Country ranking of estimated dimension of corruption in 2019

Country	COR	Country	COR	Country	COR
Finland	304.05	Estonia	272.75	Spain	253.86
Luxembourg	297.78	Belgium	272.45	Slovakia	246.35
Sweden	293.54	Lithuania	267.84	Poland	241.83
Netherlands	291.09	France	265.91	Greece	231.42
Denmark	290.48	Malta	265.84	Italy	231.25
Ireland	290.13	Cyprus	264.08	Hungary	220.93
Austria	287.93	Slovenia	257.91	Bulgaria	216.22
Germany	286.07	Czech Republic	256.23	Croatia	212.87
Portugal	276.46	Latvia	255.19	Romania	211.30

Source: author's own processing

The development of the corruption dimension score and the final ranking based on it are shown in Table 7. A high score indicates a low presence of corruption, and a low score indicates the opposite. According to the calculation algorithm, with the help of the estimation we ranked the first nine countries with the highest corruption score in the green zone, the next nine countries are included in the orange zone having a moderate corruption level, and the last nine are marked with red as they are those with a low corruption score. Considering this information as well as the other data collected, we will try to make some observations, compare the score obtained with the index (CPI) provided by Transparency International that we have presented in Table 8 and formulate some personal opinions.

Table 8. Country ranking of perceived corruption and estimated dimension of corruption for 2019

No.	Country	CPI	COR
1	Denmark	87	290.48
2	Finland	86	304.05
3	Sweden	85	293.54
4	Netherlands	82	291.09
5	Luxembourg	80	297.78
6	Germany	80	286.07
7	Austria	77	287.93
8	Belgium	75	272.45
9	Ireland	74	290.13
10	Estonia	74	272.75
11	France	69	265.91
12	Portugal	62	276.46
13	Spain	62	253.86
14	Lithuania	60	267.84
15	Slovenia	60	257.91

No.	Country	CPI	COR
16	Cyprus	58	264.08
17	Poland	58	241.83
18	Czech Republic	56	256.23
19	Latvia	56	255.19
20	Malta	54	265.84
21	Italy	53	231.25
22	Slovakia	50	246.35
23	Greece	48	231.42
24	Croatia	47	212.87
25	Hungary	44	220.93
26	Romania	44	211.30
27	Bulgaria	43	216.22

Source: author's own processing

The first zone includes the countries with the highest corruption level scores, ranging from 304.05 points to 276.46 points. Predictably, we find that Finland ranks first with 304.05 points in the ranking provided. We say predictably because in *Transparency International's* ranking it also ranks well, in second place with 86 points. If we are to compare the two rankings at the Green Zone level, we can notice that the countries remain largely the same, although on different positions, which shows that the public perception of corruption is quite realistic. The exception is Portugal, which according to Transparency's score ranks 12th in the orange zone, but ranks much better, climbing to the last position in the green zone (9th place). In other words, there was a sense of pessimism in this country about the perception of corruption. The average score of this zone is 290.84 points and is 10.06% higher than the average of the second zone.

The orange and red areas also show some differences as countries marked red according to Transparency International are in between. These are Spain and Poland, which according to our estimates rank 19th and 21st, respectively, indicating that there was a fairly optimistic public perception of corruption. For the countries included in the orange zone the average score is 264.24 points, representing a decrease of 9.14% compared to the average of the top 9 countries. We can also see that the last 4 countries in the red zone are the same in both rankings, even if they have different positions.

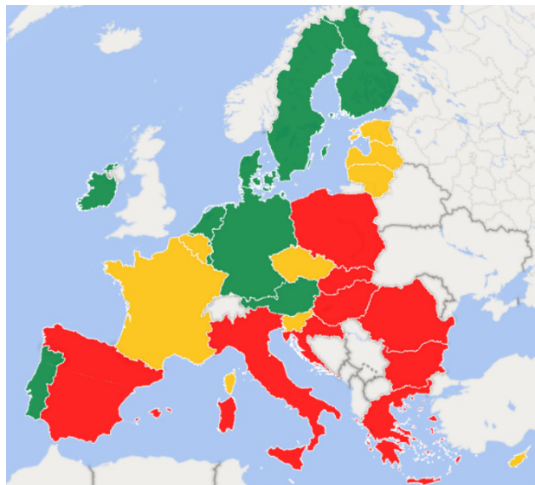
Early findings show that as we approach the red zone, the differences between the estimation of the phenomenon and the corruption perception level start to become more poignant. According to the estimated ranking, the average score of the sample is 261.55 points and the closest country to the average is Cyprus, with a difference of two and a half points. In contrast, the Transparency International ranking gives a sample average of 63.85 points, with Spain and Portugal closest to the average. At the same time, we can see that both the first

and the last positions differ in the two rankings. The difference between the two rankings is due to the criteria used. While the rankings provided by Transparency International experts focus on qualitative variables that reflect the perception of experts on the corruption level in their country and are highly subjective, our estimated score is based on econometric modelling and operations based on relevant data for each country analysed.

As far as Finland is concerned, I believe that the citizens of this country are severely critical of corruption, and this is demonstrated by the maximum scores recorded by this country on some of the variables analysed. I think that it would be very interesting to carry out surveys in which the citizens of one country estimate the dimension of corruption in other countries, but in relation to their own country. We can anticipate that if a survey were carried out in Romania on the corruption level in France, this country would most likely be placed in the green zone, among the top 9 countries, while according to the two rankings, France is in the intermediate zone (orange zone).

As the literature also points out, it is very important for citizens to perceive the dimension to which anti-social phenomena have an impact on their lives and living standards, but there is also a need for a complementary element, such as the above ranking, to provide a more comprehensive picture of what corruption entails.

Based on the data in Table 8, a map showing the EU-wide dispersion of corruption intensity for 2019 has been produced (see Figure 1). It can be seen that corruption is more prevalent in the southern and south-eastern parts of the European Union, as the countries in these areas are marked in red, having the lowest corruption score. This also includes the poorest countries in this economic and political union, namely Bulgaria, Greece, Romania and Hungary. The situation is good in the central and northern part, because the green zone is predominant and the scores indicate a low presence of corruption, which can also be explained by the fact that these countries have a significantly high economic potential, also visible in the values of the standard of living variable. In the east and west, the corruption level is predominantly medium, with countries marked orange, and there is also the possibility that a good proportion of them will migrate over time to the red zone or at best to the green zone. The distribution is not very homogenous, especially if we look at the western and south-western part of Europe, where Spain, marked with red, is located between Portugal, marked with green, and France, marked with orange. Therefore, the dimension of corruption for EU countries and access to one of the three zones depends to a significant dimension on the level of economic and social development and the variables analysed.

Figure 1. Map of corruption in the European Union in 2019

Source: author's own processing

Estimating the dimension of corruption for 2019 at the level of EU countries reveals significant influences of certain country characteristics on corrupt behaviour. Comparing the ranking obtained based on the estimated average corruption score with the one provided by *Transparency International* shows multiple similarities, which means that in addition to the fact that the approach used fits the purpose of the research, the perception of professionals correlates with the characteristics mentioned for the European Union countries, in particular trust in justice, trust in state institutions and freedom of expression.

The fact that Finland, Denmark and Sweden are at the top of the two corruption rankings and that Romania, Greece and Bulgaria are at the bottom suggests that the methodology used can be used/is valid for longer periods of time.

6. CONCLUSIONS

Estimating the dimension of the corruption phenomenon for 2019 in the countries of the European Union highlights the significant influences that certain characteristics of countries have on corrupt behavior. Comparing the ranking obtained on the basis of the estimated average corruption score with that provided by *Transparency International* shows multiple similarities, which means that in addition to the fact that the approach used is suitable for research, the perception of professionals correlates with the characteristics mentioned for European Union countries. with confidence in the judiciary, trust in state institutions and freedom of expression.

The positioning on the first positions in the two rankings that refer to the corruption phenomenon, of the following countries: Finland, Denmark and

Sweden, and ranking in the last positions of Romania, Greece and Bulgaria leads us to think that the methodology used can be used for periods. longer time.

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MIHAELA TOFAN
IRINA BILAN
ELENA CIGU
(EDITORS)

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European Finance,
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of Post-Pandemic Recovery

This volume is the result of the research carried out within the Jean Monnet CHAIR European Financial Regulation, and reunites the papers presented at the International Conference „European Finance, Business and Regulation – EU FIRE 2022”, organized at „Alexandru Ioan Cuza” University of Iasi, in May 2022. In the extraordinary context of the global post-pandemic Covid-19 crises, 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. A special attention was paid to the mechanism for recovering form the post-pandemic economic crises, using regulatory mechanisms.

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