

audit

FINANCIAR

Anul XXI, nr. 170 - 2/2023

2/2023

- **Asigurarea securității datelor financiar-contabile stocate în baza de date a sistemelor ERP**
- **Ensuring the Security of Financial-Accounting Data Stored in the Database of ERP Systems**



- **Evaluarea importanței unui ERP în procesul bugetar și atingerea performanțelor**
 - **Auditorii situațiilor financiare recunosc punctele de vedere legate de ESG ca un aspect cheie de audit?**
- **Analiza implementării soluțiilor IA în sectorul financiar**
- **Transparența instituției supreme de audit prin analiza traficului paginii oficiale de internet**
- **Relația sustenabilă dintre investițiile în capitalul uman și operațiunile de fuziuni și achiziții**

- **Assessing the Importance of an ERP in the Budgetary Process and Achieving Performance**
 - **Do Financial Statement Auditors Recognise ESG-Related Aspects as Key Audit Matters?**
- **AI Solutions Implementation Analysis**
- **The Transparency of the Supreme Audit Institution through the Analysis of Official Website Traffic**
- **The Sustainable Relationship between Investments in Human Capital and M&A**

Practici organizaționale în auditul intern din perspectiva pandemică

Organizational Practices in Internal Audit from a Pandemic Perspective

Sumar / Content

audit
FINANCIAR

Nr. 2(170)/2023

Laura-Eugenia-Lavinia BARNA, Bogdan-Ștefan IONESCU

- *Ensuring the Security of Financial-Accounting Data Stored in the Database of ERP Systems*.....291

Casiana Maria DARIE

- *Assessing the Importance of an ERP in the Budgetary Process and Achieving Performance – Bibliometric Analysis*300

Magdalena INDYK

- *Do Financial Statement Auditors Recognise ESG-Related Aspects as Key Audit Matters?*312

Mirela-Simina MIHAI

- *AI Solutions Implementation Analysis using T-O-E Framework*321

Ivan DIONISIJEV, Todor TOCEV

- *The Transparency of the Supreme Audit Institution in the Republic of North Macedonia through the Analysis of Official Website Traffic*331

Mihai-Daniel GAVRILĂ, Alexandra ȘTEFAN

- *Organizational Practices Related to Internal Audit in Economic Entities from a Pandemic Perspective*.....340

Irina CHIRIAC

- *The Sustainable Relationship between Investments in Human Capital and M&A*355

Revistă editată de
**Camera Auditorilor Financiar
din România**

Str. Sirenelor nr. 67-69, sector 5,
București, OP 5, CP 83

Director științific:
prof. univ. dr. **Pavel NĂSTASE**

Director editorial:
dr. **Corneliu CÂRLAN**

Redactor șef:
Cristiana RUS

Secretar de redacție:
Cristina RADU

Prezentare grafică și tehnoredactare:
Nicolae LOGIN

*Colegiul editorial științific și colectivul
redacțional nu își asumă
responsabilitatea pentru conținutul
articolelor publicate în revistă.*

Indexare în B.D.I.:

Cabell's;
Deutsche Zentralbibliothek für
Wirtschaftswissenschaften;
DOAJ;
Ebsco;
ERIH PLUS;
Global Impact Factor;
Google Scholar;
Index Copernicus;
ProQuest;
Research Papers in Economics
(RePEc);
Ulrich's

Marcă înregistrată la OSIM,
sub nr. M2010 07387

Telefon: +4031.433.59.22;
Fax: +4031.433.59.40;

E-mail: auditfinanciar@cafr.ro;
revista@cafr.ro; <http://revista.cafr.ro>;
[facebook.com/revistaauditfinanciar](https://www.facebook.com/revistaauditfinanciar)

ISSN: 1583-5812,

ISSN on-line: 1844-8801

Tipar: SC Print Group Serv SRL
Str. Baicului nr. 82, sector 2,
București
e-mail: office@printgroup.ro

Scientific Editorial Board

Dinu Airinei – „Al. I. Cuza” University, Iași

Veronel Avram – Craiova University

Yuriy Bilan – Szczecin University, Poland

Daniel Botez – „Vasile Alecsandri” University, Bacău

Ovidiu Bunget – West University Timișoara

Alain Burlaud – The National Conservatory of Arts and Crafts, Paris

Tatiana Dănescu – University of Medicine, Pharmacy, Sciences
and Technology of Târgu Mureș

Nicoleta Farcane – West University Timișoara

Liliana Ionescu-Feleagă – Bucharest University of Economic Studies

Lilia Grigori – Academy of Economic Studies of Moldova, Chișinău

Allan Hodgson – University of Queensland, Australia

Bogdan Ștefan Ionescu – Bucharest University of Economic Studies

Costel Istrate – „Al. I. Cuza” University, Iași

Maria Manolescu – Bucharest University of Economic Studies

Ion Mihăilescu – „Constantin Brâncoveanu” University, Pitești

Vasile Răileanu – Bucharest University of Economic Studies

Ioan Bogdan Robu – „Al. I. Cuza” University, Iași

Donna Street – Dayton University, SUA

Aurelia Ștefănescu – Bucharest University of Economic Studies

Adriana Tiron Tudor – „Babeș-Bolyai” University, Cluj Napoca

All rights of this edition are reserved to the Chamber of Financial Auditors of Romania (CAFR). Reproduction, even partially, on any support, and the sale are prohibited without prior consent of the CAFR, being subjects to the stipulations of the copyright law.

Important for Authors!

The articles are submitted to the editor by e-mail at: audit.financiar@cafr.ro or revista@cafr.ro, compulsory in MS Office Word format, in black-and-white.

The authors are kindly requested to comply with the following:

- the language the article is drafted in is English
- the optimal size of the article is: 7-10 pages with 2000 signs/page, spaces included;
- the article must mention the title, the research methodology used, authors' contributions, the impact on the accounting profession and the references;
- an Abstract is compulsory, which must be written at the 3rd person plural, presenting the subject of the research, the main problems and authors' contributions;
- 4-5 Keywords;
- JEL Classifications.

Tables and graphs are developed in black and white whit up to six shades of gray and sent also separately, if they were elaborated in MS Office Excel.

The review of the articles is performed by members of the Scientific Assessment Council of the „Audit Financiar” Journal, by means of the „double-blind review” method, that is, the reviewers do not know the names of the authors, nor the authors know the names of the reviewers.

Assessment criteria for articles: innovative input, topicality, importance and relevance for the subject matter; the quality of the research methodology; clarity and pertinence of the presentation and argumentation; the relevance of the bibliographic sources used; contribution made to the research in the area.

The resolution of the Scientific Assessment Council of the journal can be: acceptance; acceptance with revisions; rejection. The results of the assessments are communicated to the authors and only the articles approved by the Scientific Assessment Council are published.

More details can be found on our website auditfinanciar.cafr.ro, section „For Authors Only”.

audit FINANCIAR

Nr. 2(1701)/2023

Chamber of Financial Auditors of Romania

67-69 Sirenelor Street, District 5,
zip code 050855, Bucharest, OP 5,
CP 83

Scientific Director:

Professor **Pavel NĂSTASE**, Ph.D.

Editorial Director:

Corneliu CĂRLAN, Ph.D.

Editor in Chief:

Cristiana RUS

Editorial Assistant:

Cristina RADU

DTP: **Nicolae LOGIN**

The Scientific Editorial Board and the editorial technical team shall take no responsibility for the content of the articles published in the journal.

International Databases:

Cabell's;

Deutsche Zentralbibliothek für
Wirtschaftswissenschaften;

DOAJ;

Ebsco;

ERIH PLUS;

Global Impact Factor;

Google Scholar;

Index Copernicus;

ProQuest;

Research Papers in Economics
(RePEc);

Ulrich's

OSIM Trademark no. M2010 07387

Chamber of Financial Auditors of Romania

Phone: +4031.433.59.22;

Fax: +4031.433.59.40;

E-mail: auditfinanciar@cafr.ro;

revista@cafr.ro;

<http://auditfinanciar.cafr.ro>;

facebook.com/revistaauditfinanciar

ISSN: 1583-5812,

ISSN on-line: 1844-8801

Printing:

SC Print Group Serv SRL

Str. Baicului nr. 82, sector 2, București

e-mail: office@printgroup.ro

Ensuring the Security of Financial- Accounting Data Stored in the Database of ERP Systems

Laura-Eugenia-Lavinia BARNA,
Ph.D. Student, Bucharest University of Economic Studies,
Accounting Doctoral School,
e-mail: barnalaura15@stud.ase.ro

Prof. Univ. Bogdan-Ştefan IONESCU,
Ph.D., Bucharest University of Economic Studies,
Management Informatics Systems Department,
e-mail: bogdan.ionescu@cig.ase.ro

Abstract

The accounting profession is in a continuous digitization process, as a result of the frequent use of computer systems with the aim of streamlining and improving the daily activity of employees in this field. However, in addition to the benefits offered by these IT systems for accounting professionals, the risks to which the information processed and stored with these IT systems could be subjected must also be taken into account so that the quality of financial-accounting activities is not disturbed.

The present work aims to analyze the main risks to which the financial-accounting data processed and stored in the database of the ERP systems could be subjected, as well as the way to ensure the security of the financial-accounting data within these integrated IT solutions. This article focused on a quantitative research using bibliometric analysis which is basically based on the analysis of a sample of 263 articles dealing with the two key topics of the paper: "data security" and "ERP systems".

Key words: risk; data security; ERP systems; integrated IT solutions; digitization; bibliometric analysis;

JEL Classification: G32, L86, M15, M40, M41

To cite this article:

Barna, L.-E.-L., Ionescu, B.-Ş., (2023), Ensuring the Security of Financial-Accounting Data Stored in the Database of ERP Systems, *Audit Financiar*, vol. XXI, no. 2(170)/2023, pp. 291-299, DOI: 10.20869/AUDITF/2023/170/008

To link this article:

<http://dx.doi.org/10.20869/AUDITF/2023/170/008>
Received: 23.03.2023
Revised: 31.03.2023
Accepted: 2.05.2023

Introduction

The technological evolution of recent years has determined the digitization of a large number of activities both in the financial-accounting field and in other fields, thus facilitating the processing, analysis and storage of a large volume of information in a shorter period of time as a result of the use IT systems. However, the data must be kept safe from the moment of their introduction into the IT systems until the moment of their storage, processing and analysis, because recently "users have become the most vulnerable link of security systems" (Popescu and Popescu, 2018).

The specialized literature associates this technological evolution with an important factor in the increase in the number of IT security threats. However, ensuring adequate controls and a protection system would be of great help in ensuring the security of financial-accounting data stored in IT systems.

The purpose of the paper is to identify the main measures that can be adopted, so that the financial-accounting information processed and stored in the database is not subject to risks arising from the online environment.

1. Literature review

1.1. The importance of ERP systems in the financial-accounting activity

The ERP (Enterprise Resource Planning) system is an integrated IT system used by companies to manage a large volume of data and resources (Pareek, 2014; Hrischev, 2020; Kitsantas, 2022). According to Senior Software (2020), the ERP system allows "the integrated management of processes and operations from different business areas: purchases, sales, accounting, production, customer relationship management, project management, but also other logistics activities".

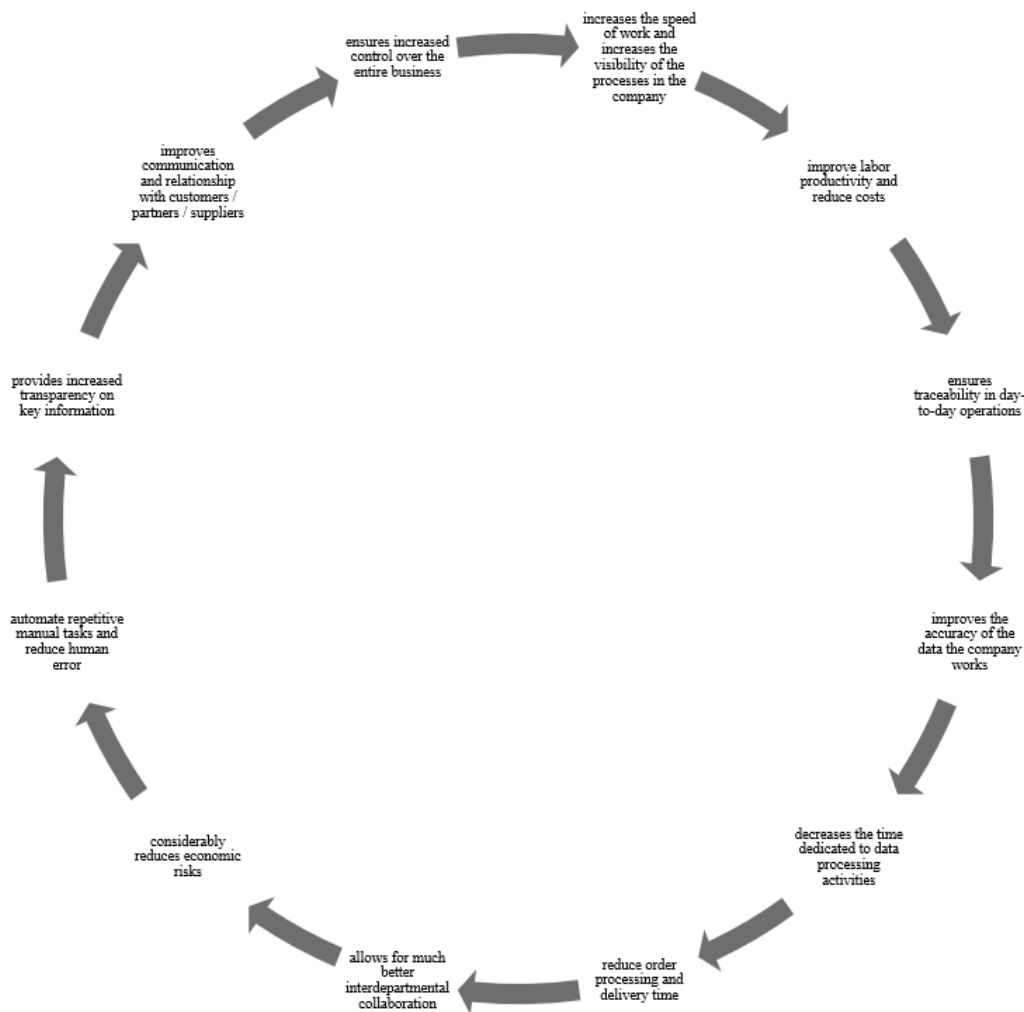
Many companies operating in the financial-accounting field decide to implement these ERP systems, because it gives them centralized access to essential data for the company, allowing the automation of a wide range of operations that streamlines the flow of information. Moreover, ERP systems offer users the possibility to enter data directly from the keyboard, either to import the data, or to use the transfer technology through EDI (Electronic Data Interchange) technology. The main functionalities of ERP systems that lead companies to implement these IT solutions are:

- the entire flow of information within the company is recorded in the common database of the ERP system;
- ensures the automation and standardization of various operational processes;
- ensures monitoring of activities and resources used by the company;
- electronic generation of various financial and accounting documents (invoices, statements, accounting notes);
- manages the financial operations within the company;
- generates various reports necessary for the financial-accounting department, but also for other departments of the company.

The main benefits offered by ERP systems for companies are presented in *Figure no. 1*.

Kanellou (2013) identified three relevant reasons why companies decide to implement ERP systems: "the increased demand for real-time information, the generation of information for decision-making and the need for application integration". Nawaz and Channakeshavalu (2013) also identified other benefits: business process reengineering, standardization of systems and processes, improved practices.

Figure no. 1. The benefits of ERP systems



Source: Author's creation, 2022

1.2. The main categories of risks to which financial and accounting data processed and stored in ERP systems can be subjected

According to Popescu and Popescu (2018), the main types of cyber risks / attacks that a company can face are:

- attacks on applications;
- cyber espionage (unauthorized access to data processed using ERP systems);
- theft or physical loss of equipment;
- soft malware;

- errors;
- incorrect business process mapping.

1.3. The main measures to ensure the security of financial-accounting data stored in the database of ERP systems

The main levels of data security which any computer system should have are: physical security, logical security, access security, service security. Access security is defined in the specialized literature as the way users access the

system. In this way, controlled access to sensitive data within the company can be ensured. The security of the services requires that the detection and warning functions in case of a potential cyber-attack or data theft are activated throughout the use of the computer system.

Hrishev (2020) and Parthiban and Nataraj (2019) observed that the first step in ensuring data security in the database of ERP systems is the system architecture, in other words the way in which that information system is designed. ERP systems present an architecture based on three levels:

- *the presentation level* – the terminals, where data is entered and transferred between levels
- *application level* – the IT system server (data processing based on algorithms and business functions)
- *database level* – database server of the IT system (data storage area)

Among the measures that can be adopted to ensure the security of financial data stored in the database of ERP systems could be (Chang et al., 2014):

- controlled access to data, so each user has access only to the data they use on a daily basis;
- the level of data sharing is strictly defined so that the data confidentiality procedure is not violated;
- data communication to customers is carried out through well-defined and secure communication channels (eg: SharePoint, Google Drive, etc.) and are well encrypted

Another step would be to ensure a stable and encrypted internet connection (She and Thuraisingham, 2007; Sorheller, 2018) so that the risk of data theft is minimized.

2. Research methodology

The research method used by the authors in this article aimed to define the concept of security of financial-accounting information processed and stored in the database of the ERP system with the help of scientific articles dealing with this subject. The articles were collected between October 29, 2022 and November 5, 2022 from different databases such as: Web of Science, Scopus,

Emerald, Elsevier and other databases, using the following search keywords: "data security", "ERP systems", "financial-accounting data stored in ERP systems", "security of databases", "security of ERP systems".

The authors also constructed some research questions presented below regarding the topic of the article, trying to answer them with the help of the information collected from the selected articles:

Q1. *What is the framework for ensuring internal control?*

Q2. *What are the benefits offered to users of ERP systems?*

Q3. *What are the main solutions to ensure the security of financial-accounting data?*

Thus, to quantify the results related to the security of ERP systems, the authors used a bibliometric analysis focused on the grouping of the keywords "security" and "ERP systems" in relation to other keywords identified in the selected articles from the Web of Science platform. The sample consisted of 263 articles relevant to the subject of the paper, published between 1996 and 2022, most of them being published after 2012, when the massive evolution of the concept of digitization of activities took place. To process the data on the selected articles, the authors used the VOS viewer application. The obtained results are presented in the next section.

3. Results analysis

Analyzing the 20 articles selected from different databases, the authors identified a series of information relevant to the topic of the article. To the question "*What is the framework for ensuring internal control?*", the authors Chang (2014) and Chang et al. (2014) identified the fact that system security and internal controls in ERP systems are ensured by "security policy, user authentication method, database security". The controls applied maintain the reliability of the IT system, but also the availability of financial data. However, the authors Chang et al. (2014) defined the framework for ensuring internal control through 5 components presented in *Figure no. 2*.

Figure no. 2. The framework for ensuring internal control



Source: Author's creation based on Chang et al. (2014)

Hrishev (2020) states that each user must have controlled access to data within the database. Most ERP systems use the Citrix application that contains an infrastructure that secures information on the Internet using an access portal (Gateway) with a username and password, thus increasing data security.

The database of the ERP system is structured either by SQL (Structured Query Language) or Oracle DB. New versions of ERP systems use NoSQL databases, ensuring a higher degree of security.

To the question "What are the benefits offered to users of ERP systems?", the author Kanellou (2013) states that ERP systems offer users an increase in the flexibility of information, the improvement of the quality of reports, but also the improvement of the decision-making process. Kitsantas (2022) identified that ERP systems provide better information in a shorter time, at a lower cost. Other authors are of the opinion that the implementation of ERP systems is quite expensive, but along the way this investment made by the company is amortized. Nawaz (2013) believes that ERP systems offer users the opportunity to process information much faster, but also to centralize data much more efficiently as a result of the integration of a large number of functions that ERP

systems have, useful functions for different departments in within the companies.

The authors Pareek (2014), Onyshchenko (2018), Rîndașu (2018) and Parthiban and Nataraj (2019), believe that the main measures for data security in ERP systems are: Internet network security (applying an HTTPS protocol, ensuring user authentication based of digital certificates), database security (isolation of the server from the rest of the company's IT infrastructure), application server security, information security on the used terminals and ERP systems security.

She and Thuraisingham (2007) and Sharma and Maheshwari (2014) are of the opinion that financial-accounting data security should first be ensured from inside and outside the company and proper internal control of the ERP system should be ensured. Also, a recovery plan should be designed in the event of a cyber-attack or data theft (Xu et al., 2002; Weng and Hung, 2014).

The FBI (2012, cited by Mangiuc, 2016) identified the following sources of IT security risk as mainly disgruntled employees, then independent hackers or economic espionage and business intelligence.

To the question "What are the main solutions to ensure the security of financial-accounting data?", the author Rădulescu (2016) identified the following security solutions for a company's data on the following levels:

- *logic*: encryption, backup, monitoring, antivirus, audit, firewall
- *physical*: securing managed equipment
- *operational-administrative*: creation of working procedures, trainings with employees, etc.

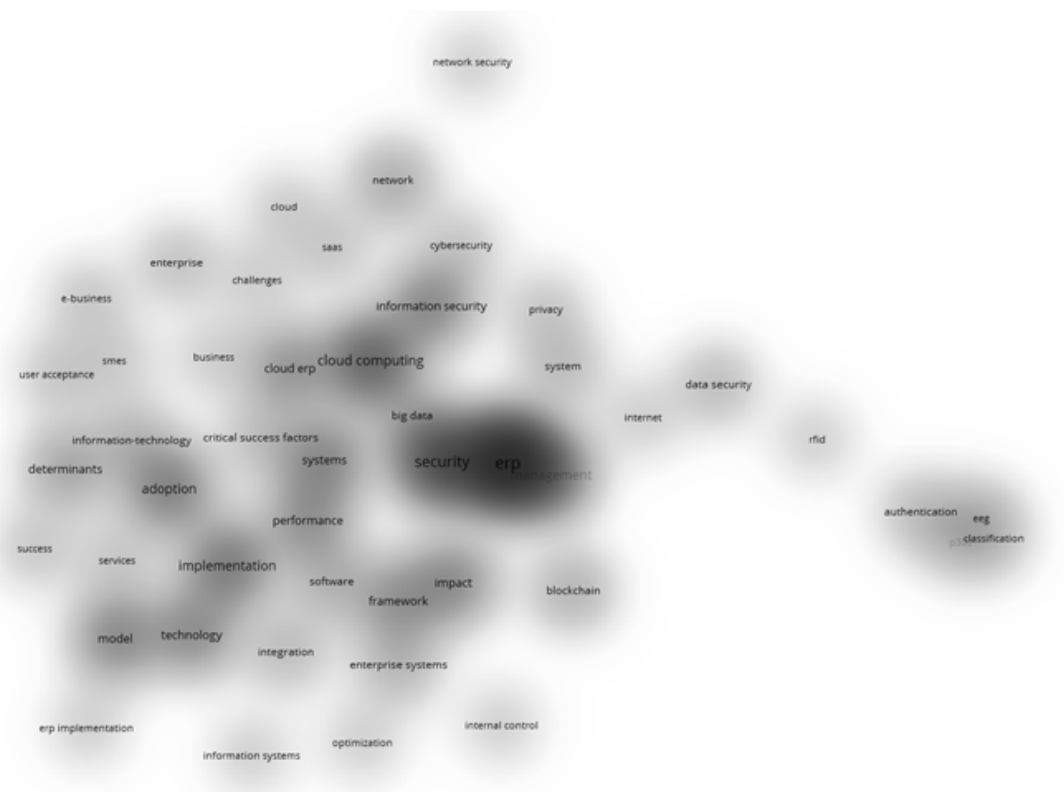
According to the study carried out by Rîndaşu (2019), the majority of accounting professionals who have been the target of a cyber-attack most often contact the IT department of the company. Other accounting

professionals turn to their line manager, data protection officer, authorities or colleagues to resolve issues arising from the cyber-attack.

Analyzing in detail the identified information, the authors of this article believe that the security of financial-accounting data should be ensured both inside the company and outside it.

In **Figure no. 3**, the data on the 263 articles selected from the Web of Science based on the keywords "security" and "ERP systems" in relation to other keywords, show that many articles present the security of ERP systems from the perspective of new technologies such as: cloud computing, Big Data, e-business, SaaS.

Figure no. 3. The relationship between the keywords "security" and "ERP systems"



Source: Authors' creation based on information collected about articles from the Web of Science platform (2023)

The authors identified 7 groups of keywords (clusters), which are presented in detail in **Table no. 1**. The clusters that registered the most items show shades of intense black, following gradually, with the

decrease in the number of items, this shade to predominate in shades of dark gray and light gray. Thus, clusters containing the fewest elements show a very light gray shade.

Table no. 1. Keyword clusters identified in the selected articles

Groups (Cluster)	Specific keywords
Cluster 1 (9 items)	Big Data, Blockchain, Cybersecurity, Information security, Internet, Management, Privacy, Security, Systems
Cluster 2 (10 items)	Adoption, Cloud, Cloud computing, Determinants, E-business, Information-technology, Performance, SaaS, Smes, User acceptance
Cluster 3 (7 items)	ERP implementation, Information systems, Integration, Model, Optimization, Success, Technology
Cluster 4 (7 items)	Business, Challenges, Cloud ERP, Critical success factors, Enterprise, Network, Network security
Cluster 5 (7 items)	Authentication, Classification, Data security, EEG, ERP, P300, RFID
Cluster 6 (6 items)	Enterprise systems, Framework, Impact, Implementation, Internal control, Software
Cluster 7 (1 item)	Services

Source: Author's creation

As can be seen in **Table no. 1**, the keywords identified are related to each other, all words refer to new technologies in the IT field. Thus, the correlation identified by the authors would be mostly between

ERP systems, security, authentication and implementation.

Table no. 2 shows the distribution of publications and their citations by geographic region.

Table no. 2. Distribution of publications and their citations by geographic region

Country / geographic region	Number of papers written in each country / region	The number of citations of articles originating from that region
USA	45	996
China	47	314
India	34	198
Anglia	17	693
Saudi Arabia	9	142
Taiwan	19	97
Germany	16	203
Italy	5	46
Australia	6	171
Canada	8	204
South Africa	8	44
South Korea	8	138
Pakistan	5	29
Spain	6	68
Czech Republic	5	11
Indonesia	6	3
Polonia	7	20
Romania	7	16
Ukraine	5	9
TOTAL	263	3402

Source: Author's creation

Most articles come from countries developed in terms of digitization such as: China, USA, India, Taiwan, England and Germany. The other countries such as Italy, Australia, Canada, South Africa, South Korea, Pakistan, Spain, Czech Republic, Indonesia, Poland, Romania, Ukraine register a small number of articles, between 5 and 8 articles per country or region.

4. Conclusions

Even if the digitization process has gained momentum in recent years, the provision of adequate security of the data processed and stored with these ERP systems must also be taken into account.

The digitization of activities in the financial-accounting field emerged as a result of the need for users to have quick access to relevant information in real time.

As a result of the post-pandemic effects of COVID-19, there has been an increase in the number of security incidents both nationally and globally according to the report issued by CERT. How to reduce the occurrence of such an incident is still under investigation. Technological progress has influenced the appearance of new categories of vulnerabilities in ensuring data security.

Considering the articles selected to substantiate the theoretical basis of the present article, the authors concluded that a stable and strong organizational culture can prevent the occurrence of security incidents, because the flow of information is much better managed by the members of such an organization, and the activities are much better defined within the organization.

REFERENCES

1. Chang, S.I. (2014), Internal control framework for a compliant ERP system, *Information & Management*, vol. 51, pp. 187-205, DOI: <http://dx.doi.org/10.1016/j.im.2013.11.002>
2. Chang, S.I., Yen, D.C., Chang, I.C., Jan, D (2014), Internal control framework for a compliant ERP system, *Information & Management*, vol. 51, pp. 187-205, DOI: <http://dx.doi.org/10.1016/j.im.2013.11.002>
3. Hrischev, R. (2020), ERP systems and data security, *IOP Conference Series: Materials Science and Engineering*, vol. 878, pp. 1-8
4. Kanellou, A., Spathis, C. (2013), Accounting benefits and satisfaction in an ERP environment, *International Journal of Accounting Information Systems*, vol. 14, pp. 209-234, DOI: <http://dx.doi.org/10.1016/j.accinf.2012.12.002>
5. Kitsantas, T. (2022), Exploring Blockchain Technology and Enterprise Resource Planning System: Business and Technical Aspects, Current Problems and Future Perspectives, *Sustainability*, vol. 14, DOI: <https://doi.org/10.3390/su14137633>
6. Mangiuc, D.M. (2016), Auditing security for the Cloud, *Audit Financiar*, vol. XIV, nr. 3 (135) / 2016, pp. 302-311, DOI: 10.20869/AUDITF/2016/135/302
7. Nawaz, M.N., Channakeshavalu, K. (2013), The impact of Enterprise Resource Planning (ERP) systems implementation on business performance, *Asia Pacific Journal of Research*, vol. 2, nr. 4, pp. 30-47
8. Onyshchenko, O. (2018), Introducing ERP system as a condition of information security and accounting system transformation, *International Journal of Engineering & Technology*, vol. 7, nr. 4.3, pp. 530-536
9. Pareek, R. (2014), Analytical Study of Cloud ERP and ERP, *International Journal of Engineering and Computer Science*, vol. 3, nr. 10, pp. 8710-8717
10. Parthiban, K., Nataraj, R.V. (2019), An efficient architecture to ensure data integrity in ERP systems, 5th International Conference on Advanced Computing & Communication Systems, pp. 236-241, DOI: 978-1-5386-9533-3/19/\$31.00
11. Popescu, C.R., Popescu, G. (2018), Risks of cyber attacks on financial audit activity, *Audit Financiar*, vol. XVI, nr. 1 (149) / 2018, pp. 140-147, DOI: 10.20869/AUDITF/2018/149/006
12. Rădulescu, M.C. (2016), Considerations on the selection and prioritization of information security

- solutions, *Audit Financiar*, vol. XIV, nr. 5 (137)/2016, pp. 564-574, DOI: 10.20869/AUDITF/2016/137/564
13. Rîndașu, S.M. (2018), Information security challenges – vulnerabilities brought by ERP applications and cloud platforms, *Audit Financiar*, vol. XVI, nr. 1 (149) / 2018, pp. 131-139, DOI: 10.20869/AUDITF/2018/149/005
 14. Rîndașu, S.M. (2019), The Security of Accounting Information – A Perception-Based Analysis of the Practitioners from Romania, *Audit Financiar*, vol. XVII, nr. 2 (154) / 2019, pp. 298-305, DOI: 10.20869/AUDITF/2019/154/012
 15. Senior Software (2020), What is ERP?, available at: https://www.seniorsoftware.ro/erp/ce-inseamna-erp-software-erp-sistem-erp-soft-erp-romania/?gclid=EAlaIQobChMlu_KCr_-W-wIVZI9oCR2tZgyVEAAYASAAEgLVLD_D_BwE, accessed on November 10, 2022
 16. Sharma, C., Maheshwari, S. (2014), Ten security practices to a formidable ERP system, *International Conference on Smart Structures & Systems India*, pp. 41-50, DOI: 978-1-4799-6506-9/9
 17. She, W., Thuraisingham, B. (2007), Security of Enterprise Resource Planning Systems, *Information Systems Security*, vol. 16, pp. 152-163, DOI: 10.1080/10658980701401959
 18. Sorheller, V.U., Hovik, E.J., Hustad, E., Vassilakopoulou, P. (2018), Implementing cloud ERP solutions: a review of sociotechnical concerns, *Procedia Computer Science*, vol. 138, pp. 470-477
 19. Weng, F., Hung, M.C. (2014), Competition and challenge on adopting Cloud ERP, *International Journal of Innovation, Management and Technology*, vol. 5, nr. 4, pp. 309-313
 20. Xu, H., Nord, J.H., Brown, N., Nord, G.D. (2002), Data quality issues in implementing an ERP, *Industrial Management & Data Systems*, vol. 102, nr. 1, pp. 47-58, DOI 10.1108/02635570210414668

Assessing the Importance of an ERP in the Budgetary Process and Achieving Performance – Bibliometric Analysis

Casiana Maria DARIE,
Ph. D. Student, Faculty of Accounting and Management
Informatics, Bucharest University of Economic Studies,
Romania, e-mail: dariecasiana14@stud.ase.ro

Abstract

The purpose of this research is to emphasize that ERP systems are relevant tools in the budgetary process and lead to improved performance of organizations. To achieve it, a bibliometric analysis of the articles published in the period 2018-2022 in the Scopus database was made based on the terms: budget, performance, management, ERP.

Achieving performance in the activity of a company involves setting goals. Budgets, by translating these objectives into figures related to resource consumption and achieving results, become tools for measuring performance. The creation of an efficient budgetary system in close connection with the forecasts of the organizations for the medium and long term represents the key to a profitable economic activity through which the right path towards the achievement of the proposed objectives can be followed and the possible deviations can be detected in time. A special role in all stages of the budgetary process is played by the ERP system used in that entity.

Key words: budget; budget system; performance; ERP;

JEL Classification: M40, M42, O33

To cite this article:

Darie, C. M., (2023), Assessing the Importance of an ERP in the Budgetary Process and Achieving Performance – Bibliometric Analysis, *Audit Financiar*, vol. XXI, no. 2(170)/2023, pp. 300-311, DOI: 10.20869/AUDITF/2023/170/009

To link this article:

<http://dx.doi.org/10.20869/AUDITF/2023/170/009>
Received: 30.01.2023
Revised: 10.03.2023
Accepted: 5.05.2023

Introduction

The change from a predominantly experience-based management, to an effective management focused on anticipating and preventing problems, cannot be achieved without a review of the forecasting processes within the management as a whole. In the context of the many environmental variables that need to be taken into account, planning is the most effective way to exploit the economic, managerial, commercial, technical and technological potential, as well as the human resources available within an organization. An ERP system can be used to create and track a budget, as well as to monitor the differences between the actual values and the forecasted values. That is why through this research we propose the following objectives:

- Knowledge of the specialized literature;
- Performing a bibliometric analysis based on the terms: budget, performance; management, ERP through Bibliomatrix, VOSviewer and Power BI Desktop;
- Using the quantitative method through: descriptive analysis, clustering, impact indices;
- Identification of authors, countries and areas where studies on these topics have been published;
- Identifying the relationships between the mentioned terms;

The expected results will refer to the role of using an ERP in organizing the budgetary process and increasing the performance of organizations.

1. Synthesis of the specialized literature

1.1. The budget

In the nineteenth century, following industrialization and economic growth, the need arose to manage and control the increasingly complex budgets of companies. The first authors to address the subject of budgets were Frederick Winslow Taylor and Henri Fayol, who developed the concepts of scientific management and general management. In the 1920s, the budget became an essential component of financial and accounting management, and in the 1950s the budget was integrated into the strategic planning process of companies.

According to Finney (1993), the budget is a tool that helps organizations manage their resources and predict future financial results. It is important to bear in mind that a budget can be a flexible plan that can be adjusted according to the situation, rather than a rigid set of values. It is a way to ensure that the organization has the resources to achieve its goals and goals.

On the other hand, John Kay (2010) argues that budgeting can be too restrictive and lead to a focus on short-term goals at the expense of long-term success. He suggests that organizations should focus on their overall goals and goals rather than getting lost in the details of budgeting. He also points out that budgeting can be a time-consuming process that can distract organizations from their core mission.

1.2. Enterprise Resource Planning

ERP systems are designed to process various transactions and to facilitate the integration of all processes, starting from production planning and development to managing relationships with partners such as customers, suppliers, financial institutions, ANAF and investors.

In the literature, ERP is approached from the perspective of its benefits for business and how it can be successfully implemented and used. This topic is covered through case studies, research reports, and books that address topics such as implementation strategies, change management, systems integration, and investment rate assessment.

In the '90s, the concept of Enterprise Resource Planning appeared, with the finding by companies of the need to integrate their separate systems. Joseph Orlicky, known as the father of MRP (Material Requirements Planning), was one of the first to talk about ERP claiming that its objective is "to deliver the right products at the right time at the right cost".

According to Anderegg, Enterprise Resource Planning is an "integral and complete software solution for an enterprise", covering all its functional areas.

Gartner - The technology research company introduced the term "ERP" in 1990 and defined ERP as "a set of integrated software modules that allow the organization to control and manage many business activities related to production, delivery, billing and inventory management".

Performance management through ERP and budgeting

We believe that for a performant management it becomes essential to use an ERP. According to Aloini, D. (2012) the system is an integrated combination of software that contributes to the management of business processes in an organization through standard procedures and the sharing of data in the operational parts with the help of a common database.

The purpose of ERP systems is to integrate information from different departments of the organization, thus replacing isolated systems such as dedicated accounting software, sales, resource planning, etc. Therefore, systems can help organizations improve the management of their business processes by reducing costs and sharing information in real time, which highlights the achievement of efficient management.

In addition to the aforementioned purpose, ERP systems have an important feature, namely that of automation. They are tailored and improved over a long period of time, offering the latest versions in line with the expansion of technology, such as Dynamics 365 BC, SAP ERP, Oracle, etc. packages. While organizations have their own processes and flows that keep their standards competitive, some of them are adapting non-standard processes to apply to new systems and take advantage of future updates.

As more and more organizations adopt such integrated systems, their implementation and modernization are identified as one of the top five IT priorities for CIOs globally, according to surveys conducted by Deloitte & Touche/IDG Research Services Group and Morgan Stanley. Currently, organizations around the world allocate a serious budget to complete the installation of ERP systems or to modernize existing systems.

ERP (Enterprise Resource Planning) and management systems are closely related because an ERP system can provide management with valuable information and tools to make better decisions, increase efficiency and improve overall business performance.

Therefore, a budget, when implemented correctly, can have a positive impact on the performance of an organization by supporting management in making better decisions, allocating resources more efficiently and achieving the financial objectives set.

A popular solution for both accountants and financial analysts, however, remained the use of Excel. In fact,

according to studies, in Excel most of the tasks are performed as well as planning and managing budgets. Indeed, this is a familiar and easy to use tool, although it also has a major drawback, the fact that this tool was designed to be operated by a single user. To overcome this problem, organizations try to integrate Excel with other tools and software programs, so they can export data from the system and manipulate into spreadsheets, or why not, import data from Excel into the system used.

ERP systems can help improve the effectiveness of budgeting and overall financial management within an organization by providing a centralized and integrated view of financial data. By integrating data from different departments and functions, such as financial data, supply chain and human resources, ERP systems can provide management with a complete and accurate picture of the organization's financial situation.

A digital enterprise platform allows management to have access to a single source of information for planning, budgeting and forecasting. It combines data obtained through ERP systems with information from other sources, such as market analysis or social media, providing management with a complete and accurate picture of the enterprise's situation, thus supporting more informed decision-making.

Among the benefits brought by the implementation of budgets in the ERP system of an organization can be listed:

- Faster strategies, achieved by eliminating manual operation with real-time information at their disposal;
- Flexibility and familiarity combined with the computing power offered by the integrated system;
- Fast implementation, for example Dynamics 365 provides budget planning functions, the calculation of available funds being done by clicking a single button. It simplifies the entire process so that authorised users can carry out annual budget planning or long-term strategic planning;
- Financial analysts can ensure that the budget planning process works as expected by monitoring annual or monthly expenses, with the help of financial instruments made available by ERP systems, which unify operational costs and revenues;
- Budget control is an important element to ensure if budget planning is going in the right direction. ERP systems provide control functions, that enable to evaluate planned budgets and actual expenditure during the budgetary period;

- Financial forecast, the latter improving the performance management of the enterprise (EPM).

2. Research methodology

Bibliometric analysis is used in this research to evaluate the importance of the budgetary system in achieving performance using ERP (Enterprise Resource Planning) by analyzing existing scientific publications in this field. This includes the analysis of the frequency of mentioning the terms "Budgeting" and "ERP" in the titles, summaries and content of articles and books published in the field of business management and technology. It is also possible to analyse the degree of interconnectedness between these keywords and other relevant terms, such as 'performance management' (technique such as "Booleans"). At the same time, as a search technique, "wild cards" were incorporated, through which the word "budgeting" was written in restricted form (budget*), this truncation symbol offering the possibility for the database to take into account the different ways of occurrence (spelling) of this word in publications. Only the publications in the articles were considered. So, taking into account the above-mentioned techniques, the data source generated a sample of 4516 publications in the period 2000 and 2022. In order for the analysis to be as up-to-date as possible, so that the publications would cover the events of the close period, the sample was restricted to a period of 5 years, therefore the data source returned a number of 1685 publications.

The source of the database used to sample this quantitative research was Scopus, with the date of extraction of the CSV document. on 8.01.2023, where the query string contains the following expression:

(TITLE-ABS-KEY (budget*) AND TITLE-ABS-KEY (performance AND management) OR TITLE-ABS-KEY (erp*)) AND PUBYEAR > 1999 AND PUBYEAR < 2023

AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (PUBSTAGE , "FINAL")) AND (LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2018))

2.1. Design and structuring of the research methodology

To analyze the information extracted from the Scopus database, we used methods such as:

- *Descriptive analysis*: main topics; years of publication; the countries in which they were published; essential keywords.
- *Clustering*: the conceptual structure of research; the intellectual structure of research; the social structure of research.
- *Impact indices*.

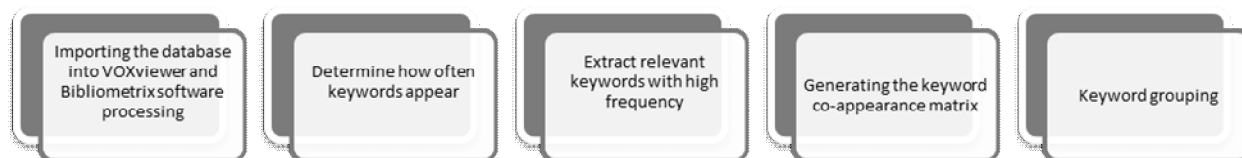
3. Use of bibliometric analysis methods and results obtained

Next, we will present the results of the research carried out using the methods: descriptive analysis, clustering and impact indices.

3.1. Descriptive analysis

The quantitative research methodology was carried out according to **Figure no. 1**. For the 2018-2022 reference range, this was how the data was evaluated and interpreted using Bibliomatrix VOSviewer and Power BI Desktop.

Figure no. 1. Design of the research methodology



Source: Own processing

To obtain the necessary data for this research, the export function from the Scopus database, "Export filter counts",

was used, followed by their processing in Power BI Desktop for a detailed analysis.

Figure no. 2. The resulting main domains based on Scopus query

No	Subject Area	Frequency	Percentage In Total Sample (%)
1	Engineering	571	17.36%
2	Environmental Science	396	12.04%
3	Social Sciences	359	10.91%
4	Business, Management and Accounting	358	10.88%
5	Computer Science	330	10.03%
6	Agricultural and Biological Sciences	192	5.84%
7	Medicine	179	5.44%
8	Economics, Econometrics and Finance	137	4.16%
9	Energy	121	3.68%
10	Decision Sciences	110	3.34%

Source: Self-processing using Power BI Desktop, 2023

As we can see from **Figure no. 2** the key terms used in the query are found primarily in the field of Engineering in a total sample proportion of 17.36%. The next field in which the frequency of occurrence of the resulting publications is observed is that of environmental sciences, with a proportion of the sample of 12.04%, followed by the domain of Social Sciences, with 10.91%. The field of Business, Management and Accounting is one that involves collaboration between various specialists, representing a proportion of the total sample of 13.95% and in the field of Decision Sciences the frequency was 110 i.e. a proportion of 3.34%. The justification for this last percentage is that this field focuses on the analysis of

methods and techniques used in the decision-making process, including statistical methods, mathematical modelling, etc. The budget may be an important factor in decision-making in some contexts, but it is not necessarily a central topic in this area.

The data presented in **Figure no. 3** provides an overview of the information in the database. They show that in the analyzed time period 2018-2022, the sources used are in the amount of 920 (magazines, books etc.), 1685 documents were analyzed and the annual growth rate was 5.77%. This indicates a steady increase in the number of documents published during this period.

Figure no. 3. The resulting main information based on the Scopus query

Main information	Data
Time period:	2018-2022
Sources (magazines, books, etc.):	920
Documents:	1685
Annual growth rate %:	5.77
Average age of documents:	2.89
Average citations per document:	8306
References:	80078
Keywords Plus (ID):	9377
Keywords of the author (DE):	6055
Authors:	5735
Documents with a single author:	123
Co-Authors on the document:	3.87
%international collaborations:	30.09

Source: Own processing using data from the Bibliometrix (Biblioshiny)

The average age of the documents is 2.89 years and the average citations per document is 8,306. The analyzed

documents were articles in which 80078 references were found.

As for the content of the documents, 9377 keywords and 6055 keywords of the author were analysed.

There were 5735 authors, and 123 documents have a single author, the average of the co-authors per document being 3.87.

The resulting percentage for "International Collaborations" shows that over 30.09% of the analyzed documents were written together by authors coming from different countries. This may indicate active international collaboration in the field in question or an increasing trend of international collaborations in this field.

In *Figure no. 4* we have presented the number of articles published each year from 2018 to 2022,

as well as their share in the total sample. The annual evolution of the number of published articles compared to the previous year is also displayed.

The following can be seen:

- in 2022 it was the highest number of published articles, with 22.73% of the total sample, while in 2019 it had the lowest number of published articles, with 18.45% of the total sample;
- every year there was an increase compared to the previous year, except for 2021 when a decrease of 3.72% was quantified.

Figure no. 4. Distribution of articles by year

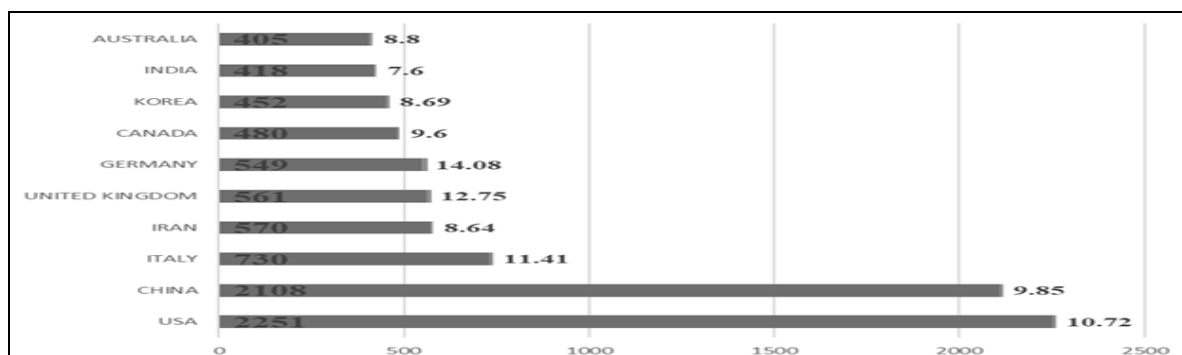
Years	Article Frequency (%)	Total Sample (%)	Previous year evolution (%)
2022	383	22.73%	13.99%
2021	336	19.94%	-3.72%
2020	349	20.71%	12.22%
2019	311	18.46%	1.63%
2018	306	18.16%	5.52%

Source: Source: Self-processing using Power BI Desktop, 2023

Next, we set out to identify the most cited countries in terms of published articles. In *Figure no. 5* each country is presented with the total number of citations (CT) and the average citations per article. It can be noted that the United States and China are the most cited countries with

respectively 2251 and 2108 citations. Italy, Iran, the UK, Germany, Canada, Korea, India and Australia are the next most cited countries. At the same time, the average citations per article varies between 7.6 for India and 14.08 for Germany.

Figure no. 5. Publishing countries/regions



Source: Own processing using Bibliometrix (Biblioshiny)

In **Figure no. 6** we presented the Word Graph (Word Cloud). It shows the frequency of keywords used in the publications analyzed. As can be seen the terms "budget control" and "budget" have many appearances in the articles, which indicates that

these elements are important topics for the chosen sample.

"Budget control" shows a frequency of 669 appearances in articles, followed by "Water management" mentioned 158 times and "optimization" with a frequency of 88.

Figure no. 6. Word Cloud



Source: Own processing using Bibliometrix (Biblioshiny)

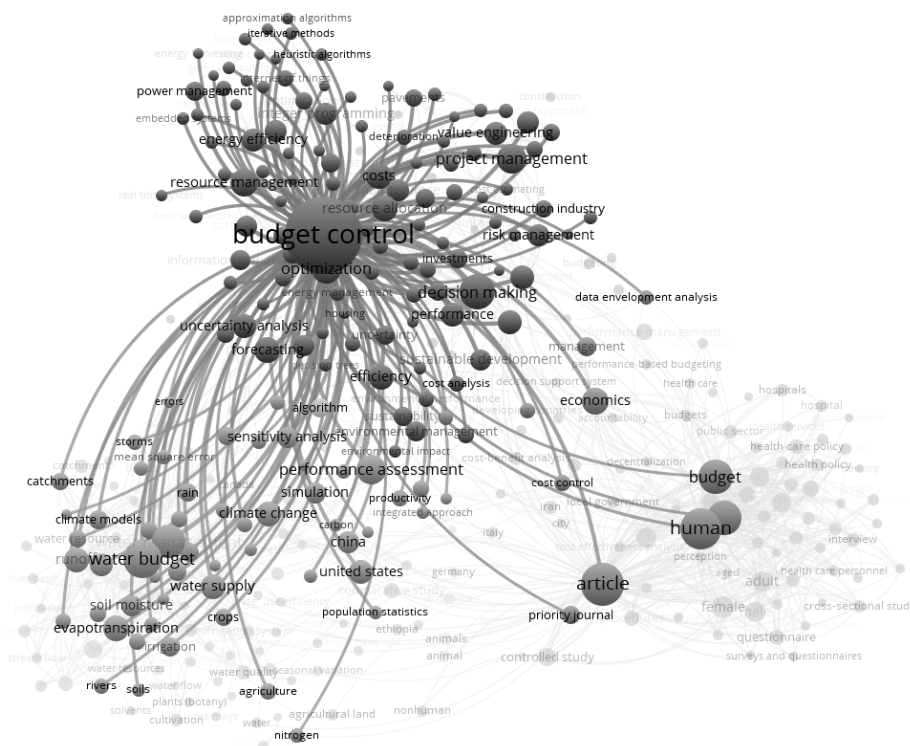
3.2 Clustering

In the first stage of the Clustering analysis, the terms that frequently appear in the researched articles in the period 2018-2022 were identified. This allowed the formation of a conceptual structure (analysis of the co-emergence of terms). The scientific impact, citation and co-citation clusters were evaluated using VOSviewer opensource software. It allows the import and analysis of information about scientific research, journals, publications, authors and references and is frequently used for building and displaying big data bibliometric networks. Bibliometric visualization focuses on reporting the distance between nodes, making it suitable for representing networks with an extended structure.

A minimum threshold of 10 occurrences was set to determine the significant terms, resulting in 337 terms. They were used to build a network view map, which showed 15,233 links between the terms and a total influence of 40,730 of these links.

The bibliometric analysis of the publications extracted from the Scopus database generated a matrix of co-emergence of key terms (**Figure no. 7**). The vertices, represented by the terms included in the analysis, are arranged according to the frequency with which they appear, providing a real picture of them. The following addition is important: the greater the size and intensity of the terms, the more significant those terms are considered in the bibliometric study, evaluated by means of Boolean queries.

Figure no. 7. Graphical representation of the relationships between key terms by means of the co-emergence matrix. Conceptual analysis



Source: own processing based on data extracted from Scopus, VOSviewer, 2023

The use of different colors in the view of the bibliometric network allowed the delimitation of clusters (thematic groupings). As a result, 4 clusters were identified following the bibliometric analysis, which were grouped and presented in **Table no.1**.

In bibliometric analysis, a cluster is a grouping of keywords or publications that have similar themes or topics. They are used to identify and organize the main themes that appear within a particular area of research or to analyze the relationships between the different topics.

Table no. 1. Interpretation of the groups of terms identified by the analysis of the co-occurrence matrix		
Cluster No.	Composition (words)	Top Relevant Terms
Cluster 1	126	"Budget control", "resource management", "decision making", "project management"
Cluster 2	119	"Water management", "performance assessments", "enterprise resource planning"
Cluster 3	85	"Budget", "humans", "article", "economics",
Cluster 4	7	"Algorithm", "Environmental", "protection".

Source: own processing based on data extracted from Scopus, VOSviewer, 2023

Therefore, the component terms are grouped into clusters according to the significant link between them.

The groupings formed have as a sphere of interest the application of budgets in various fields of activity and do

marked by different colors, such as red, green, blue, yellow, blue and purple. Among the countries/regions in the first cluster are Austria, China, Egypt, India and others; the second cluster includes the United Kingdom, Belgium, Nigeria and others; another cluster includes Germany, Italy, Spain and others; cluster four includes the US, South Korea and others; and the last two clusters are composed of countries/regions such as Canada, France, Brazil, Portugal and others.

3.3 Impact indices

Analysis of impact indices in bibliometric analysis refers to the assessment of the quality and influence of a scientific article or publication by means of standardized measures.

Therefore, the following impact indices were calculated and evaluated (**Table no.2**): H-Index, G-Index, M-Index. By analyzing them, the performance of the first 10 authors in the chosen field will be observed.

Table no. 2. Impact of authors in scientific production

Authors	h_index	g_index	m_index	TC (Total Citations)
ZHANG H.	5	8	0.833	323
WU J.	5	6	0.833	253
WANG Y.	6	12	1.000	149
ZHANG J.	6	11	1.000	123
WANG J.	6	10	1.000	120
WANG Z.	6	10	1.000	100
WANG T.	5	5	0.833	99
VANHOUCKE M.	5	7	0.833	86
WANG X.	7	9	1.167	85
YANG Y.	5	9	0.833	83

Source: own processing based on data extracted from Scopus, VOSwiewer,2023

The data summarized in **Table no. 2** shows the index values for the top 10 authors, chosen according to the total number of citations (TC) of their publications.

Based on it we have outlined the following conclusions:

- the largest h-index is 7 and belongs to the author WANG X, which means that it has 7 papers that have been cited at least 7 times, followed by ZHANG H., WU J., WANG T., YANG Y., VANHOUCKE M. whose h-index was 5;
- the largest g-index, that is 12, belongs to the author WANG Y, who is followed by WANG J and WANG Z., with a g-index of 10, which means that the first 10 works of the authors have accumulated at least $10^2 = 100$ citations together;
- the highest m-index was obtained by WANG X., with 1.167, which means that on average each work of the author was cited at least once.

Therefore, these calculations helped to measure the scientific performance of the 10 authors according to the top citations of this sample.

4. Conclusions

The use of budgeting offers advantages such as supporting the achievement of the organization's objectives, identifying areas where savings have been made or the forecasted values have been exceeded, controlling costs and improving communication and coordination between departments. However, the process can be expensive and requires coordination between departments. Comparing forecasted and actual metrics can have a negative impact on employee motivation. It should also be borne in mind that the future is unpredictable and events such as changes in government policies or natural events may affect the achievement of budgeted objectives.

Following the bibliometric analysis carried out for the period 2018-2022, a series of results were obtained regarding the terms of interest of this research ("budget", "ERP", "performance", "management". Thus:

- the fields/sections in which various papers have been published are: engineering (17.30 %), environmental science (12.04%), business, management and accounting (10.88);

- the number of articles was 1685, with over 8078 references, the rate of international collaborations being 30.09;
- the publication frequency was over 300, each year their number increased, the largest increase being in 2022, which shows the publishing interest of this research field but also the practical applicability;
- most articles have been published by authors from Germany, UK, China and Italy;
- the most cited authors are: Zhang H, Wu-J, Wang, Y.;
- the largest h-index is 7 and belongs to the author WANG X, the largest g-index of 12 belongs to the author WANG Y and the largest m-index was obtained by WANG X.

Also, through the Clustering analysis the terms that frequently appear in the articles published in the period 2018-2022 were identified, namely: *cluster 1* – "Budget control", "resource management", "decision making", "project management"; *cluster 2* – "Water management", "performance assessments", "enterprise resource planning"; *cluster 3* – "Budget", "humans", "article", "economics" and *cluster 4* – "Algorithm", "Environmental protection".

The evaluation of the keywords and the links between them demonstrated that at least during the analyzed period, 2018-2022, there were not many publications stating the direct link between the terms "budget" and "ERP". The links between these terms certainly exist, but

they use helpful elements (of intersection), such as the terms: "optimization", "project management", "efficiency", "economics", "costs", "financial management" etc.

Certainly, the ERP system plays an important role in all phases of the budgetary process within a company (which uses such a system), and the performance of a company takes into account even certain links formed by the above-mentioned terms ("optimization", "project management", "efficiency", "economics", "costs", "financial management").

Analyzing the websites presenting the ERP systems, we find that in their structure there is also the budget / budget module.

Consequently, this topic remains an open topic of interest for other researchers who want to identify the advantages of ERP systems in the budgeting activity and reaching the different levels of performance planned, especially in this economic context of digitization of many processes within the entities.

Science and technology continue to evolve, interests and research directions will constantly change. In addition, the number of publications on this topic and specific keywords will vary over time, so it is not possible to make an accurate prediction about what will happen in the future.

It is important to continuously monitor this area to learn about current trends and potential developments.

REFERENCES

1. Aloini, D., Dulmin, R., Mininno, V. (2012) Risk assessment in ERP projects. *Information Systems*, 37(3):183-199;
2. Andregg, T., (2000) ERP: A-Z Implementer's Guide for Success, *Resource Publishing*;
3. Finney, R.G. (1993) Basics of Budgeting, *American Management Association*;
4. Haddara, M. (2014) ERP Selection: The SMART Way, *Procedia Technology*, Volume 16, pp. 394-403;
5. Kay, J. (2010) Obliquity: Why Our Goals Are Best Achieved Indirectly, *Profile Books*;
6. MacCarthy, B. L., Ivanov, D. (2022) The Digital Supply Chain, *Elsevier*, pag 80-464;
7. Mayer, J.H., Esswein, M., Göbel, M. & Quick, R. (2023), Getting Digital Technologies Right – A Forward-Looking Maturity Model for Enterprise Performance Management, *Lecture Notes in Information Systems and Organisation*, pp. 183;
8. Nobari, B.Z., Azar, A., Kazerooni, M., Yang, P. (2020) Revisiting enterprise resource planning (ERP) risk factors over the past two decades: defining parameters and providing comprehensive classification, *International Journal of Information Technology*, 14(3);
9. Orlicky, J. (1975) Material Requirements Planning: The New Way of Life in Production and Inventory Management, *McGraw-Hill*;

10. Rahman, H. (2012) Henry Fayol and Frederick Winslow Taylor's Contribution to Management Thought: An Overview, *ABC Journal of Advanced Research*, Volume 1, No 2;
11. Zeng, Y (2010) Risk Management for Enterprise Resource Planning System Implementations in Project-Based Firms; available at: https://drum.lib.umd.edu/bitstream/handle/1903/11162/ZENG_umd_0117E_11718.pdf?sequence=1&isAllowed=y
12. Control bugetar (semnificație) | Avantaje dezavantaje (mcfairbanks.com); available at: <https://ro.mcfairbanks.com/1480-budgetary-control>
13. <https://www.inecta.com/>;
14. <https://www.netsuite.com/portal/resource/articles/erp/erp-implementation-phases.shtml>;
15. Latest Microsoft Dynamics 365 ERP Blogs | Narola Solutions; available at: <https://www.narolasolutions.com/blog/microsoft-dynamics-erp>
16. The 12 Best Business Budgeting Software Tools in 2023, available at: <https://www.cubesoftware.com/blog/best-business-budgeting-software-tools>.
17. Understand the 4th Era of ERP (gartner.com); available at: <https://www.gartner.com/smarterwithgartner/understand-the-4th-era-of-erp>

Websites

Do Financial Statement Auditors Recognise ESG-Related Aspects as Key Audit Matters?

Magdalena INDYK,
Ph. D., FCCA, Financial Analyst,
e-mail: mag.indyk@gmail.com,
ORCID: 0000-0001-9141-162X

Abstract

One of the recent trends in ESG (which stands for Environmental, Social, and Corporate Governance) is an attempt to combine sustainability and financial reporting through direct references to financial statement figures (cf. the ED IFRS S1, S2, the CSRD). This article aims to verify whether it is possible. For this reason, it was assumed that Key Audit Matters (KAMs) identified by financial statement auditors might be a valuable source of information. Identification of ESG-related KAMs by auditors may prove that ESG information is directly traceable to a financial statement and, thus, quantifiable. The empirical part was based on 142 audit reports on the consolidated financial statements for 2021. The sample focused on ESG-related capital groups with the parent entity listed on the Warsaw Stock Exchange. 292 KAMs were obtained, among which 38 (13.01% of the sample) were identified as ESG-related (32 Environmental, 1 Social, and 5 Governance). This research paper: (1) confirms that it is possible to link ESG matters and their outcomes directly to financial statement categories, (2) shows that some areas could be more challenging to quantify, for example, social or governance aspects which may not be seen directly as a financial statement category, (3) comments on KAMs as a good information source if well-written. The article underlines that any attempts to combine sustainability and financial reporting might be demanding. The ESG-exposed businesses are privileged here as their financial statements naturally present ESG-related categories. However, it raises further questions about the presentation, comparability, and integrated reporting quality of all entities, which will have to consider financial and ESG linkages in the future. This article does not answer these questions, is limited to the perspective of KAMs, and, thus, touches only on identified financial statement categories. The article, with its findings, may be important to standard-setters, companies, and other researchers contributing to ESG, financial reporting, and financial audit.

Key words: ESG; financial statement; key audit matters; IFRS S1; IFRS S2; CSRD;

JEL Classification: M48, K2, Q56

To cite this article:

Indyk, M., (2023), Do Financial Statement Auditors Recognise ESG-Related Aspects as Key Audit Matters?, *Audit Financiar*, vol. XXI, no. 2(170)/2023, pp. 312-320, DOI: 10.20869/AUDITF/2023/170/010

To link this article:

<http://dx.doi.org/10.20869/AUDITF/2023/170/010>
Received: 10.02.2023
Revised: 28.02.2023
Accepted: 6.05.2023

Nowadays, sustainability reporting is one of the critical topics researchers and professionals discuss. It aims to provide a set of non-financial information, including corporate involvement in ESG, which stands for Environmental, Social, and Corporate Governance matters. Despite a magnitude of ESG-related aspects (such as proper identification, measurement, and presentation), there is also an interesting attempt to link sustainability reporting with financial statements, meaning to look for the financial implications of ESG activities.

For example, the Corporate Sustainability Reporting Directive (the so-called CSRD), which was finally published in the Official Journal of the EU on December 16, 2022², assumes five reporting areas: (i) business model; (ii) policies, including due diligence processes implemented; (iii) the outcome of those policies; (iv) risks and risk management; and (v) key performance indicators relevant to the business. Where applicable, the information should contain references to the other information included in the management report and figures reported in the annual (consolidated) financial statements (CSRD, Article 19a, 29a).

Two Exposure Drafts (EDs): IFRS S1 – *General Requirements for Disclosure of Sustainability-related Financial Information* and IFRS S2 – *Climate-related Disclosures*, present a similar tone. In a nutshell, a reporting entity should identify significant sustainability- and climate-related risks and opportunities and reveal how they have affected the most recently reported financial statements and how the figures are expected to change over time (ED IFRS S1, pp.22,27; ED IFRS S2, pp. 32,37).

It opens a fascinating discussion with the primary research question:

[Research Question]: Is it possible to link ESG matters and their outcomes directly to financial statement categories?

Let us begin with the fact that many researchers support the view that ESG activities cause a financial impact. Some scholars discuss ESG in light of the so-called ‘value

² The CSRD will be applicable for the first time in 2025 for the financial year 2024 and will relate to companies already subject to the Non-Financial Reporting Directive (NFRD). Subsequently, large companies (not subject to the NFRD) will provide sustainability reporting in 2026 for the financial year 2025.

creation’ (e.g., Hennisz, Koller and Nuttall, Zumente and Bistрова, 2021; Glassman, Potoski and Callery, 2017). Some studies confirm an ESG impact on a firm value (e.g. Fatemi, Glaum and Kaiser, 2018; Yoon, Lee, and Byun, 2018, Aydoğmuş, Gülay, and Ergun, 2022). Some studies relate to an ESG impact on financial performance (e.g. Velte, 2017; Ahmad, Mobarek, and Roni, 2021; Hwang, Kim, and Jung, 2021).

The results of the research studies provide a general understanding that ESG matters may be treated as factors leading to the financial implications of different types. However, they do not say much about financial statement categories and the ESG impact, which could be recognized directly by financial statement users.

Identifying and quantifying the impact of ESG factors concerning particular financial statement figures will be challenging for several reasons. Firstly, there are ESG risks and opportunities of different natures, which may not have a direct economic impact, or this impact may be difficult to assess.

Secondly, assuming ESG risks and opportunities have an impact on a financial statement, there is uncertainty about how this impact should be reported. Will a single or cumulative number say anything? Should it be instead presented as a percentage of a particular financial statement category? Should it be directly verifiable in a financial statement?

Finally, if a reporting entity provides references to the figures reported in the annual financial statements, what should be the response of a statutory auditor? On the one hand, such information should be considered in respect of ISA 720 – *The auditor’s responsibilities relating to other information and related conforming agreements*. On the other hand, obtaining assurance on ESG data is not currently part of a financial statement audit. ESG engagements may be classified under International Standard on Assurance Engagements (ISAE) 3000 (i.e., engagements other than audits or reviews of financial statements). Moreover, the IAASB is working on the International Standard on Sustainability Assurance (ISSA) 5000 – *General Requirements for Sustainability Assurance Engagements*.

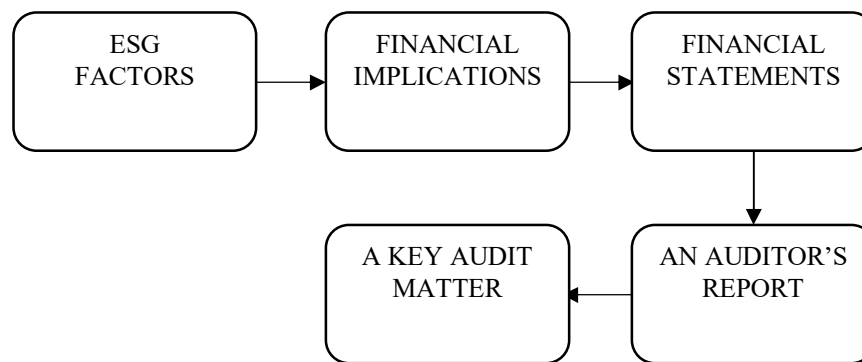
With so many question marks, I proposed a construct to address the significant concerns mentioned above (*Figure no. 1*). Assuming ESG factors have financial implications, they should be reflected, to some extent, in a financial statement, which is further examined by an

independent auditor (if specific requirements are met). Under ISA 701, an auditor must issue an audit report which includes (apart from an audit opinion) the so-called Key Audit Matters (KAMs), i.e. areas that auditors recognize during an audit as high risk of material misstatement. Identifying ESG-related KAMs would confirm that ESG matters may be linked directly to financial statement categories.

Based on this construct, the article is organized as follows. Section 1 presents the literature review and justification for

why ESG-related aspects may be recognized as KAMs in the audit report. Then, the theoretical assumptions were confronted with the empirical research. For this reason, Section 2 presents the sample selection methodology. I collected audit reports for 142 ESG-related capital groups with the parent entity listed on the Warsaw Stock Exchange. The collected audit reports were a source of 292 KAMs. Section 3 includes an analysis of the collected sample and the results. Finally, Section 4 presents conclusions, whereas Section 5 – is a discussion.

Figure no. 1. The construct of the article



Source: Own elaboration

This research paper confirms that it is possible to link ESG matters and their outcomes directly to financial statement categories. Moreover, financial auditors may recognize ESG-related aspects as KAMs, especially in the case of ESG-exposed businesses.

Out of 292 KAMs, 38 were captured as ESG-related (13.01% of the sample): 32 Environmental, 1 Social, and 5 Governance (Section 3). These KAMs, when well-written, may become a reliable source of ESG-related information confirmed by an auditor during an audit and directly traceable to a financial statement. However, the results deliberately showed that some areas could be more challenging to quantify, for example, social or governance aspects and may not be seen directly as a financial statement category. The study's results underline that any attempts to combine sustainability and financial reporting might be challenging and complex in many aspects.

Finally, the sample revealed that KAMs are often standardized and technical. Many readers may find them unreadable due to focusing on an accounting approach

without saying much about details (for example, the nature of the discussed assets or revenues).

1. The literature review

According to Article 10 of the EU Regulation 537 (2014), the audit report should include a description of the most significant assessed risks of material misstatement and a summary of the auditor's response to those risks. Moreover, ISA 701 requires auditors to communicate Key Audit Matters (KAMs), i.e. *Those matters that, in the auditor's professional judgment, were of most significance in the audit of the financial statements of the current period* (ISA 701, point 8). Such matters may involve: (a) areas of higher assessed risk of material misstatement, (b) significant auditor judgments resulting from significant management judgment, and (c) significant events or transactions (cf. ISA 701, point 9).

Despite being a mandatory requirement, the role of a KAM has been expanded beyond just fulfilling this requirement. First, many scholars examine the informative value of

KAMs, meaning the consequences of KAM disclosures. For example, a review of the academic literature by Gold and Heilmann (2019) reveals four main areas: (1) investor behavior and market reaction, (2) auditor responses (such as audit fees, audit quality, or audit delay), (3) auditor liability, and (4) client management responses. Although the results of the studies are mixed, KAMs may be treated as a communication channel.

Second, some researchers concentrate on the factors influencing the number of reported KAMs. For example, the results presented by Wuttichindanon and Issarawornrawanich (2020) associate the number of KAMs with the auditor's litigation risk, firm complexity, profitability, and industry type. Pinto and Morais's (2019) findings show that a higher number of business segments (complexity) and more precise accounting standards lead to the disclosure of a higher number of KAMs. Ferreira and Morais (2019) confirm a positive relationship between the number of KAMs disclosed and both the auditor being a Big4 and the complexity of the audited company. Verho (2021) states that companies with audit firm rotation report more KAMs than companies without rotation.

Third, a small group of researchers analyses the content of KAMs. For example, Abdullatif & Al-Rahahleh (2020) mention the following KAM groups: accounts receivable, inventory, investment property, and revenue. The authors notice that audit firms tend to report industry-specific KAMs rather than entity-specific ones. Li (2020), among the top five KAM topics, refers to revenue recognition, accounts receivable allowance, goodwill impairment, inventory write-down, and PPE impairment.

Finally, I spotted a scientific nichè, i.e. only a few scholars discuss specific KAMs. For example, Sneller, Bode, and Klerkx (2017) analyze IT-related KAMs, proving that KAMs may be a valuable source of information for an area hardly discussed elsewhere. Lynch, Mandell, and Rousseau (2021) focus on tax-related KAMs, examining the relationship with the purchase of auditor-provided tax services. Honkamäki, Mättö, and Teittinen (2022) focus on KAMs and the fair value of investment properties, examining the homogeneity of Big-4 audit reports in this area. Rainsbury, Bandara, and Perera (2022) use the circumstances of the COVID-19 pandemic and attempt to capture audit procedures explicitly related to the COVID-19 audit risks.

Considering all the above, there is an excellent research opportunity to analyze ESG-related matters from the KAM perspective. On the one hand, KAMs are widely used as an information and communication channel. On the other

hand, as mentioned in the introduction, ESG activities have financial potential and may positively impact financial performance or firm value. Consequently, they may affect financial statement categories such as revenues, tangible assets, or inventory, which are also of high auditor focus. For this reason, the following hypothesis has been formulated:

[H]: ESG-related aspects may be recognized as Key Audit Matters in the audit report.

Confirmation of this hypothesis will have significant benefits. KAMs may become a reliable source of ESG-related information examined by an auditor during an audit. If so, we receive information directly traceable to a financial statement and, thus, quantifiable. Finally, ESG-related KAMs may confirm that a company is involved in ESG.

2. The empirical research methodology

The hypothesis verification required collecting the audit reports. The population was determined based on the number of companies listed on the Main Market of the Warsaw Stock Exchange (WSE) (418 as of October 2022). Two criteria have been applied: (1) a company represents an ESG-related sector, and (2) a company is a parent entity of a capital group. All reports are related to the financial year 2021.

The first criterion enabled to identify 190 companies which were divided into three groups:

- Group A: the riskiest sectors according to the ESG Risk Atlas (2019, p.3), i.e., Oil and Gas, Metals and Mining, Power Generation (coal), Refining and Marketing, Chemicals, Technology Hardware and Semiconductor, Power Generation (excl. coal), Autos and Auto Parts, Agribusiness, and Commodity Foods;
- Group B: innovative sectors such as Biotechnology, Land and Water engineering, New Technologies, Recycling, and Renewable Energy;
- Group C: other potentially related: Paper and Packages, Plastics, Construction, Construction Materials, IT Software, IT systems.

The second criterion reduced the sample to 142 capital groups with a parent entity listed on the WSE

(see Table no. 1). Capital groups have been selected for three reasons. First, some scholars confirm a positive relationship between the number of KAMs and firm complexity (see Section 1 for examples) – the more KAMs, the greater the chance to capture specific KAMs, such as ESG-related.

Second, capital groups give a broader view than a single entity, which may be crucial in the case of aspects like ESG. Third, the auditor reports on consolidated financial statements are expected to include more KAMs than the auditor reports on statutory financial statements.

Table no. 1. The structure of a selected sample

Sector	No. of capital groups
Group A	
Agribusiness and Commodity Foods	15
Automotive and Transport	11
Chemicals	7
Metals and Mining	19
Oil and Gas	2
Power Generation	9
Technology Hardware and Semiconductor	7
Group B	
Biotechnology	5
Land and Water engineering	6
New Technologies	2
Recycling	4
Renewable energy	3
Group C	
Construction	15
Construction materials	11
IT Software	14
IT Systems	8
Plastics	2
Paper and Packages	2
Grand Total	142

Source: Own elaboration

3. The empirical research results

First of all, it was worth examining the main groups of KAMs in the selected sample, which consisted of 142 audit reports that yielded 292 KAMs. In the justification for the KAM selection (apart from the significant risk), the auditors mentioned the substantial value of a particular financial statement category, industry/business specificity, or important one-off transactions taking place in an audited financial year.

The five most common groups of KAMs in the examined sample were:

- **Revenues** – 85 KAMs (29.11%);

- **Tangible and Intangible Assets impairment** – 55 KAMs (18.84%);
- **Goodwill impairment** – 31 KAMs (10,62%);
- **Inventory measurement and impairment** – 23 KAMs (7.88%);
- **Substantial transactions** (such as the purchase or sale of shares) – 12 KAMs (4.11%).

The KAMs mentioned above were expressed in accounting terms and were often relatively standardized and technical. However, the examined sample revealed 38 specific KAMs (13.01% of the sample), which addressed ESG aspects.

First, matters related to the “Governance” component of ESG were straightforward because of the financial audit character. To some extent, all KAMs may be treated as Governance-related as they address the areas of high risk of material misstatement, which, in turn, are related to the internal control system. Five KAMs in the examined sample explicitly dealt with corporate governance, for example, with: (1) the risk of management bypassing internal controls because the President of the Company’s Management Board is also the main shareholder in the Company; or (2) the determination of effective control based on the number of shares under specific circumstances. In one specific case, the auditors issued a disclaimer of opinion proving the deficiencies in the financial reporting process and the group’s management not maintaining an adequate system of internal controls.

Second, when it comes to the “Environmental” component, it was not directly exposed, meaning auditors did not discuss an environmental risk as part of an audit risk separately. However, it does not mean that the environmental aspects were absent. If the capital group represents an ESG-exposed business (specifically from sectors listed in Group A), then ESG factors are embedded into financial statements. Consequently, KAMs may reflect on these matters directly. Unfortunately, it turned out that some KAMs are general and unreadable without details from a financial statement, meaning the auditors use technical language which focuses on describing an accounting approach without saying much about the nature of the discussed assets, inventory, or revenues, or unique/industry-specific/firm-specific factors having an impact on a write-down.

Nevertheless, 32 KAMs were specific enough to capture environmental aspects in the following areas:

- **Fixed assets impairment** in three sectors: Metals and Mining, Paper and Packages, and Power Generation (11 KAMs);
- **The valuation of biological assets** (6 KAMs);
- **Inventory impairment** (4 KAMs);
- **Valuation and completeness of provisions** for mine decommissioning costs, mining damage, and other environmental risks (3 KAMs);
- **Revenues** from the sale of copper, silver, gold, petrochemical products, and electricity; revenues derived from waste management (3 KAMs);

- **Classification and valuation of commodity contracts** (such as electricity, gas, emission allowances, oil, and coal) (2 KAMs);
- **The valuation of a photovoltaic power plant** (1 KAM);
- **Litigation and contingent liabilities** (1 KAM);
- **Substantial compensation due to the legal act** (1 KAM).

There are several observations here. Well-written KAMs listed above may be a valuable source of ESG information for audit report readers. The critical point is that these aspects are directly linked to a financial statement, meaning they are measurable and audited by an auditor. Moreover, these KAMs provide a snapshot of the business sensitivity to factors like changes in crude oil and natural gas prices, emission costs, technology, or legal environment which may affect the impairment calculation, revenue streams, liabilities, and other financial statement categories.

Third, the “Social” component was practically absent. Only one KAM was identified in this area and addressed provisions for employee benefits.

The results presented in this section prove that the construct proposed in the beginning (*Figure no.1*) is correct. We can expect ESG factors, which lead to financial implications and affect a financial statement in various categories. However, the results deliberately showed that some areas could be more challenging to quantify, for example, social or governance aspects. These areas are essential to guarantee a harmonized business organization but may not be seen directly as a financial statement category. Therefore, ESG factors may be divided into: (1) having an impact on a financial statement or not, and if yes, (2) having a direct impact on a financial statement or indirect.

4. Conclusions

This research paper confirms that it is possible to link ESG matters and their outcomes directly to financial statement categories. Moreover, financial auditors may recognize ESG-related aspects as Key Audit Matters (KAMs). However, several points should be emphasized based on the empirical results.

First, as a response to the ED IFRS S1, S2, and the CSRD, quantifying the ESG impact on a financial

statement is possible. If we discuss an ESG-exposed business (specifically from sectors listed in Group A), the financial statement will easily present ESG-related assets, liabilities, revenues, and other categories. In this case, concerning the ED IFRS S1 and S2, it should not be problematic to determine the outcome of various ESG risks and opportunities as management should perform such assessments, for example, for impairment calculation or evaluation of going concern. In the end, ESG should be directly verifiable in a financial statement. At the same time, ESG quantification for businesses not directly involved in ESG may be challenging.

Second, this research paper refers to KAMs. It is a popular topic among researchers due to its information potential. The sample revealed that KAMs are often standardized and technical. Many readers may find them unreadable due to focusing on an accounting approach without saying much about details (for example, the nature of the discussed assets or revenues).

Nevertheless, 38 specific ESG-related KAMs (13.01% of the sample) were identified: 32 Environmental, 1 Social, and 5 Governance (see Section 3). These KAMs, when well-written, may become a reliable source of ESG-related information confirmed by an auditor during an audit and directly traceable to a financial statement. However, the results deliberately showed that some areas could be more challenging to quantify, for example, social or governance aspects, and may not be seen directly as a financial statement category.

Finally, the study's results underline that any attempts to combine sustainability and financial reporting might be challenging and complex.

The future will show how the entities will approach the concept of integrated reporting in practice. Will we see an expanded report with multiple direct references to a financial statement or a sustainability report in its current form with only a few vague linkages to financial reporting? Will we receive meaningful, quantifiable information or rather descriptive explanations? These question marks may become a research opportunity in the future, for example, regarding (1) presentation and comparability of the integrated information, (2)

integrated reporting quality, or (3) the financial statement auditors' response.

This research study faces several limitations. First, capturing ESG-related KAMs was subject to our judgment as a closed catalogue of ESG does not exist. Second, the analysis was limited to KAMs selected by auditors, and their number is usually small. Third, the sample concentrated on ESG-related capital groups with the parent entity listed on the Warsaw Stock Exchange. The time frame was limited to the financial year 2021. Changes in the research methodology could impact the final results.

5. Discussion

The article touches on many themes. The topic of ESG financial implications has already been widely discussed. However, the expectation of a direct interrelation between sustainability and financial reporting is another story. The CSRD was finally published not long ago – in December 2022. The IFRS S1 and S2 are currently in the form of Exposure Drafts, and the standard-setters will issue final standards as early as possible in 2023. The number of *ex-ante* empirical studies in this aspect is limited. This article presents a somewhat skeptical view as the companies might not be prepared in reporting systems and processes compared to the pace of regulatory proposals. In addition, Pratama, Jaenudin, and Anas (2022) examined companies in Southeast Asia regarding disclosure requirements proposed in the ED IFRS S1, confirming that some disclosures are already made in the annual reports, but not all. The authors highlighted a difference between the extent and quality of the disclosures among countries and industries.

This article concentrates on the role and importance of KAMs. Regarding the five most common groups of KAMs identified in the sample, the results are similar to Abdullatif and Al-Rahahleh (2020) and Li (2020), which may suggest a standardized approach used by auditors in capturing KAMs. Similarly, to Sneller, Bode, and Klerkx (2017) (IT aspects) or Lynch, Mandell, and Rousseau (2021) (Tax aspects), this article aimed to capture a specific impact; however, the research studies with a combination of KAMs and ESG were not identified.

REFERENCES

1. Abdullatif, M., Al-Rahahleh, A. S. (2020). Applying a new audit regulation: Reporting key audit matters in Jordan. *International Journal of Auditing*, 24(2), 268-291.
2. Ahmad, N., Mobarek, A., Roni, N. N. (2021). Revisiting the impact of ESG on financial performance of FTSE350 UK firms: Static and dynamic panel data analysis. *Cogent Business & Management*, 8(1), 1900500.
3. Aydoğmuş, M., Gülay, G., Ergun, K. (2022). Impact of ESG performance on firm value and profitability. *Borsa Istanbul Review*, Vol. 22, Suppl. 2, December, pp: S119-S127
4. CSRD Directive (2022). Retrieved from: <https://data.consilium.europa.eu/doc/document/PE-35-2022-INIT/en/pdf>
5. Fatemi, A., Glaum, M., Kaiser, S. (2018). ESG performance and firm value: The moderating role of disclosure. *Global Finance Journal*, 38, 45-64.
6. Ferreira, C., Morais, A. I. (2019). Analysis of the relationship between company characteristics and key audit matters disclosed. *Revista Contabilidade & Finanças*, 31, 262-274.
7. Glassman, D., Potoski, M., Callery, P. J. (2017). Missing metrics that matter to investors: How companies can develop ESG financial value creation metrics. Available at SSRN: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3520685.
8. Gold, A., Heilmann, M. (2019). The consequences of disclosing key audit matters (KAMs): A review of the academic literature. *Maandblad voor accountancy en bedrijfseconomie*, 93(1/2), 5-14.
9. Henisz, W., Koller, T., & Nuttall, R. (2019). Five ways that ESG creates value. Retrieved from: <https://www.mckinsey.com/~media/McKinsey/Business%20Functions/Strategy%20and%20Corporate%20Finance/Our%20Insights/Five%20ways%20that%20ESG%20creates%20value/Five-ways-that-ESG-creates-value.ashx>
10. Honkamäki, T., Mättö, M., Teittinen, H. (2022). The homogeneity of BIG4 audit reports after the implementation of key audit matters in the context of fair value accounting. *International Journal of Auditing*, 26(3), 354-370.
11. Hwang, J., Kim, H., Jung, D. (2021). The effect of ESG activities on financial performance during the Covid-19 pandemic - evidence from Korea. *Sustainability*, 13(20), 11362.
12. ESG Risk Atlas. (2019). S&P Global, Retrieved from: <https://www.spglobal.com/en/research-insights/articles/the-esg-risk-atlas-sector-and-regional-rationales-and-scores>
13. IFRS S1. (2022), [Draft] IFRS S1 General Requirements for Disclosure of Sustainability-related
14. Financial Information. Retrieved from <https://www.ifrs.org/content/dam/ifrs/project/general-sustainability-related-disclosures/exposure-draft-ifrs-s1-general-requirements-for-disclosure-of-sustainability-related-financial-information.pdf>
15. IFRS S2. (2022), [Draft] IFRS S2 Climate-related Disclosures. Retrieved from <https://www.ifrs.org/content/dam/ifrs/project/climate-related-disclosures/issb-exposure-draft-2022-2-climate-related-disclosures.pdf>
16. ISA 701, Retrieved from: https://www.ifac.org/system/files/publications/files/ISA-701_2.pdf
17. Li, H. (2020). A study of key audit matters disclosure. *Modern Economy*, 11(2), 399-406.
18. Lynch, D., Mandell, A., Rousseau, L. M. (2021). The determinants and unintended consequences of expanded audit reporting: Evidence from tax-related key audit matters. Available at SSRN: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3689349.
19. Pinto, I., Morais, A. I. (2019). What matters in disclosures of key audit matters: Evidence from Europe. *Journal of International Financial Management & Accounting*, 30(2), 145-162.
20. Pratama, A., Jaenudin, E., Anas, S. (2022). Environmental, Social, Governance - Sustainability Disclosure Using International Financial Reporting Sustainability Standards S1 in Southeast Asian Companies: A Preliminary Assessment. *International Journal of Energy Economics and Policy*, 12(6), 456-472. <https://doi.org/10.32479/ijeep.13581>
21. Rainsbury, E., Bandara, S., Perera, A. (2022). Auditors' response to regulators during COVID-19: disclosures of key audit matters. *Asian Review of Accounting*, vol. 31, issue 1, 42-56.

22. Regulation 537/2014, Retrieved from: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014R0537>
23. Sneller, L., Bode, R., Klerkx, A. (2017). Do IT matters matter? IT-related key audit matters in Dutch annual reports. *International Journal of Disclosure and Governance*, 14, 139-151.
24. Wuttichindanon, S. and Issarawornrawanich, P. (2020), Determining factors of key audit matter disclosure in Thailand, *Pacific Accounting Review*, Vol. 32 No. 4, pp. 563-584. <https://doi.org/10.1108/PAR-01-2020-0004>
25. Velte, P. (2017). Does ESG performance have an impact on financial performance? Evidence from Germany. *Journal of Global Responsibility*. Vol. 8, no. 2, pp. 169-178
26. Verho, E. (2021). The effect of audit firm rotation on key audit matters: Evidence from European Union. Retrieved from: https://helda.helsinki.fi/dhanken/bitstream/handle/10227/421344/Verho_Emia.pdf?sequence=1
27. Yoon, B., Lee, J. H., Byun, R. (2018). Does ESG performance enhance firm value? Evidence from Korea. *Sustainability*, 10(10), 3635.
28. Zumente, I., Bistrova, J. (2021). ESG importance for long-term shareholder value creation: Literature vs. practice. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(2), 127.

AI Solutions Implementation Analysis using T-O-E Framework

Mirela-Simina MIHAI,
Ph. D. Student, Bucharest University of Economic Studies,
e-mail: mihaimirela15@stud.ase.ro

Abstract

The author studied the impact of technological, organizational and environmental contexts on the way of implementing solutions based on Artificial Intelligence. The importance of this topic is given by the increasing interest of companies in all fields of activity in adopting solutions based on Artificial Intelligence to help achieve the desired results.

The objective pursued in this research is to carry out an analysis of the current situation of financial services regarding how to implement solutions based on Artificial Intelligence, as well as a practical guide for companies that want to implement Artificial Intelligence.

The Technological-Organizational-Environmental framework is a complex and comprehensive research framework for technological solutions. The technology context includes technologies in financial sector companies as well as those provided by technology companies. Organizational context refers to organizational preparation and management support in implementing such solutions. Environmental context refers to industrial characteristics and government regulations.

In Romania, there are enough solutions based on Artificial Intelligence, and companies have the necessary infrastructure to implement them. The top management is interested in providing the necessary support for the implementation of solutions based on Artificial Intelligence. Legislative instability does not prevent the implementation process of Artificial Intelligence, but slows it down.

Key words: artificial intelligence; digitalization; automation; financial services; technological solutions;

JEL Classification: M40, M41, M48

To cite this article:

Mihai, M.-S., (2023), AI Solutions Implementation Analysis using T-O-E Framework, *Audit Financiar*, vol. XXI, no. 2(170)/2023, pp. 321-330, DOI: 10.20869/AUDITF/2023/170/011

To link this article:

<http://dx.doi.org/10.20869/AUDITF/2023/170/011>

Received: 19.01.2023

Revised: 13.03.2023

Accepted: 8.05.2023

Introduction

Nowadays, in all sectors of activity, solutions such as digitization, automation and Artificial Intelligence represent a determining force for the desired profit.

The financial sector is one of the first and most accessible sectors of activity where these technologies produce changes and their implementation is on an upward trend. Solutions based on Artificial Intelligence are the key to success for companies that offer financial services and want to be competitive on the market; IT companies, who want to develop and offer the best solutions to their customers; the government, which wants to provide the necessary support for companies in this unstable environment and for customers who want to work with the best specialists and get more consulting and support services.

The most appropriate way to do this analysis is by examining the big picture where each stakeholder is an influencer for the desired success. This is why in this study valuable structured interview responses from 29 financial specialists and IT service providers were collected and analyzed using the Technology-Organizational-Environmental (T-O-E) Framework. As a result, this study provides the reader with useful insights and a starting point when deciding to implement AI-based solutions.

The ability of a machine to imitate human actions is called Artificial Intelligence (Luo et al., 2018). AI represents one of the most important technologies for the process of creating a better future (Andrews, 2017). AI has Machine Learning (ML) and Deep Learning as subcategories (Ahmad et al., 2019; Lin, 2019).

ML is a subfield of AI that uses statistical models to develop predictions. ML uses algorithms to collect empirical and historical data to analyze and generate results based on the algorithms it uses (AISheibani, 2018, Ling, 2020).

ML puts programs through a learning process that is of two kinds:

- *Supervised*. In this case a human provides solutions to the program when it detects errors.
- *Unsupervised*. In this case, the program learns automatically and can be said to imitate human intelligence (Cutting et al., 2021; May et al., 2019).

The impact of ML in the financial sector:

a) *In the audit*

- Machine learning expertise
- Reduced audit staff
- Improved fraud detection
- Emphasis on internal control

b) *Tax compliance*

- Reduced time for checking the material
- New opportunities for tax planning
- Machine learning expertise
- Improved services

c) *Fiscal advisory services*

- Reduced information processing time
- Improved accuracy and reduced costs
- Machine learning expertise
- Emphasis will be placed on value-added services within the company

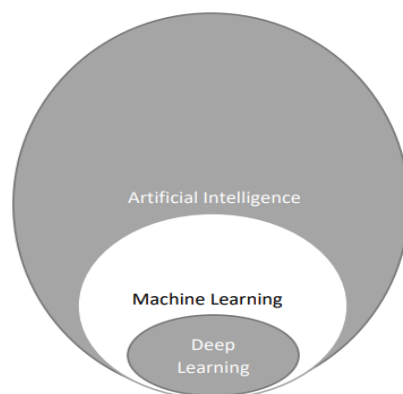
d) *Accounting*

- Reduced time for invoice processing and other repetitive activities
- More complex reports generated on time
- Consulting for clients (Izhar et al., 2020).

Deep learning is a sub-category of ML that uses neural networks to generate desired results. It works like a human neural network. If using ML we can analyze data through a linear function, Deep Learning allows us to analyze data using non-linear functions (Chollet, 2017).

Figure no. 1 shows the relationship between the three concepts most used in specialized studies; some of the studies, however, consider that they do not overlap, but intersect (Cutting et al., 2021; Massaro et al., 2016).

This study presents a qualitative analysis based on a structured interview that follows the three basic concepts of the Technology-Organization-Environment (T-O-E) framework. The work is divided into four parts: the specialized literature, in which the characteristics of High-Tech companies are presented, the methodology, where the T-O-E Framework and the research framework are presented, and the conclusions, which briefly present the most important findings and future research directions.

Figure no. 1. The relationship between AI, ML and Deep Learning


Source: Cutting et. al. 2021

1. Analysis of specialized literature

In the case of High-Tech companies, we can talk about a whole history of investments in digitization, automation and cloud computing. These actions can be considered drivers for the implementation of AI solutions (Chen et al., 2016). But more important are the digital mindset and resources that extend across the organization. In this way CFOs who work in High Tech companies have an advantage compared to their CFO colleagues who work in companies where such solutions are not implemented. They have the opportunity to use data differently to bring value and provide important insights to clients (ACCA, 2020).

High Tech companies have the resources to use modern tools such as AI, ML, Deep Learning to help their company grow (IFAC, 2020).

A study conducted by Accenture in 2022 with 1,300 CFOs from various industries showed that teams in High Tech companies have all the resources to apply and use these new technologies, compared to their colleagues in other companies. In High Tech 81% of CFOs use ML in financial data processing, compared to 68% of all CFOs included in the study. And 38% of them found an operational increase in efficiency due to the use of AI solutions together with other technologies (Inn, 2016; Kruse et al., 2019).

In the financial sector, CFOs working in High Tech companies use digital tools to increase their ability to collaborate with the entire business. This helps them overcome difficult business periods more easily by using

AI solutions combined with real-time data to have a better view of end-to-end value chains and make faster and more informed decisions (Huang et al., 2021).

With this useful information, they will be able to understand and find the roots that cause deviations, errors and loss of value. They are engaged in a learning process designed to understand new ways to use the value of data, in providing meaningful insights used to collaborate across the enterprise and increase efficiency. Financial organizations use these capabilities to be more agile to market change and improve forecast accuracy (Accenture, 2022).

CFOs in High Tech companies have a greater ability to support colleagues in other departments with significant insight for decision-making compared to other CFOs. In their case, 81% provided useful data for risk analysis, and in the case of the other CFOs, only 70% could provide this information. Technology helped them improve their relationships with colleagues in supply chain and operations (Luo et al., 2018).

Accenture's survey shows a wide gap between finance and supply chain and business operations departments, an area where finance teams need to invest time and energy to foster a better relationship. 20% of CFOs in High tech companies help the business manage operational risk using the data provided and only 35% use it to find ways to deal with business volatility (Massaro et al., 2016).

Financial organizations using AI solutions and other technologies need to run analytics on both internal and external data to understand business vulnerabilities and

measure the potential impact on business revenue forecasts earlier. Financial professionals at these companies have expertise in analytics that, used with access to data, can predict supply chain risk and potential revenue impact. They can use technology to help the organization sense future opportunities and threats, according to an article published by CECCAR in 2019.

2. Research methodology

The first step is an international analysis of the literature of the last 10 years, scientific articles from databases such as: Elsevier, Taylor and Emerald.

Wanting to observe how Romania applies technology, we conducted a structured interview to which a sample of 29 participants with managerial or executive roles in the financial and technological field of activity responded, according to Annex A. Interview respondents.

Interviews were conducted by telephone and lasted between 45 minutes and one hour. The answers to the interview were written by hand in Romanian, and after the

interview they were translated into English in the Excel program, where the analysis of this study was carried out.

The steps followed in the analysis of the structured interview are presented in *Figure no. 2*.

2.1. Research framework

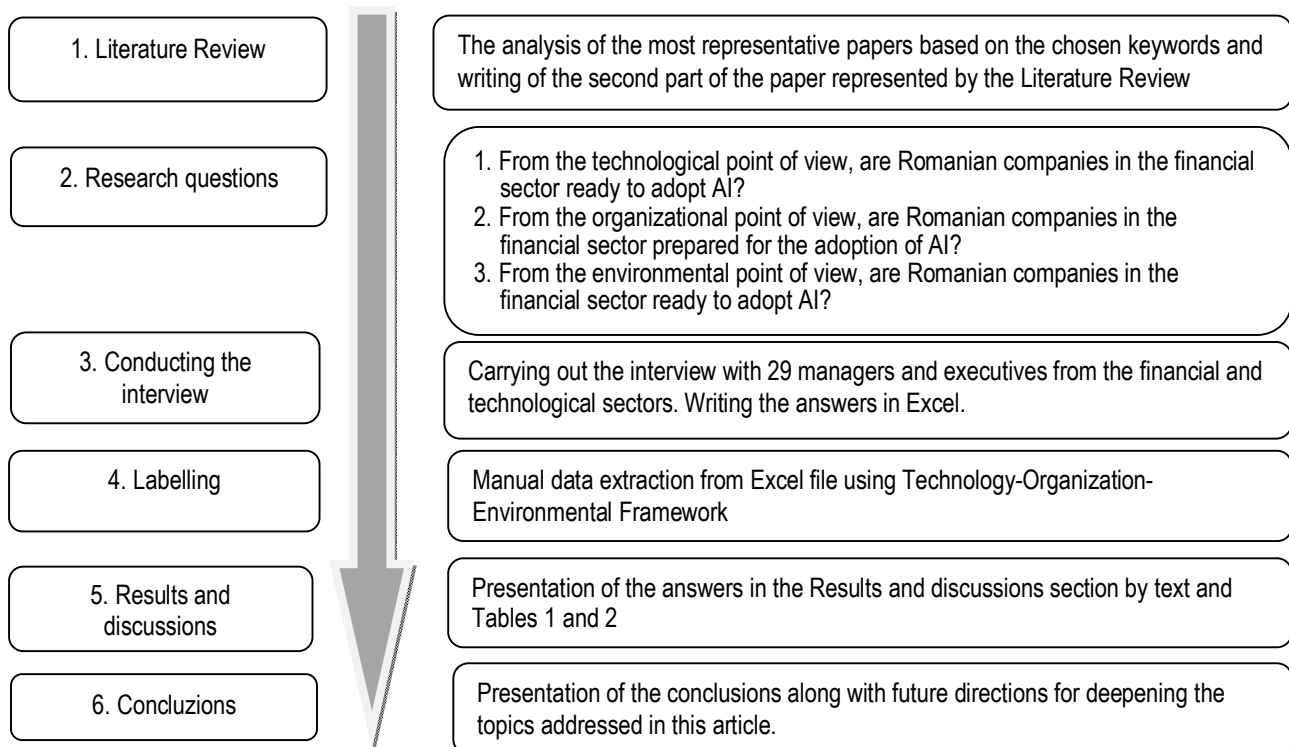
Three research questions were defined, the answers of which were centralized in Excel, where the coding was also carried out. The answers that were found in the majority of respondents are presented in **Tables no. 1 and 2** of the “Results and Discussion” section.

Research question no. 1: From a technological point of view, are Romanian companies in the financial sector ready for the adoption of AI?

Research question no. 2: From an organizational point of view, are Romanian companies in the financial sector prepared for the adoption of AI?

Research question no. 3: From an environmental point of view, are Romanian companies in the financial sector ready to adopt AI?

Figure no. 2. The steps followed in the analysis of the structured interview



Source: Adaptation from Kallio et al., (2016), Massaro et al. (2016), Stoica et al. (2022)

To ensure a structured way of analyzing the results of the interviews, the Technology-Organization-Environment Framework (TOE) was used as a research method in this article.

2.2. Technology-Organization-Environment Framework (TOE)

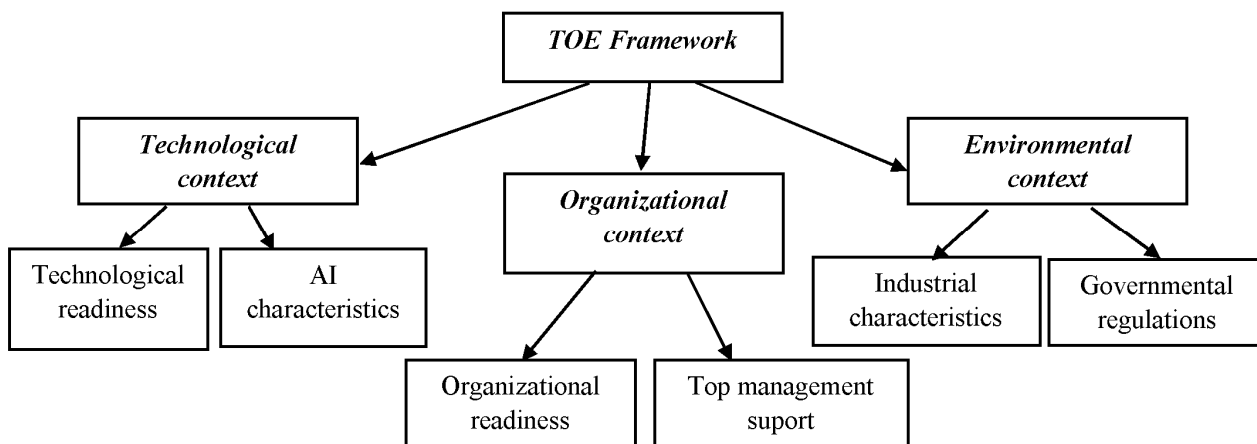
The *T-O-E Framework* method was developed by Tornatzky and Fleischer in 1990 with the aim of studying the context of technological innovation. This framework is used in the context of innovations and has gained strong empirical endorsement in this context. It represents an organization-wide theory, having three main elements used: technology, organization and environment. These elements have an impact on the processes of technology adoption and implementation in a company.

The technological context is represented by the internal and external technologies that can be implemented by a company. A company's current technological level represents internal technologies and influences the level and pace of technological change that the company is able to undertake. External technologies are represented by the technological solutions available on the market and also their characteristics: price, customization option, complexity, promised results (Zhu et al., 2004).

The context of the organization presents some characteristics of the company: size, organizational model, managerial structures, human resources.

The environmental context is represented by the structures in a particular industry and regulations. It includes factors such as: competitors, customers, community and government (Baker, 2011).

Figure no. 3. TOE Framework Representation



Source: Author's representation using Tornatzky et. al. (1990), Baker (2011)

3. Results and Discussion

The three elements of the framework are divided into two subcategories each, as represented in *Figure no. 3* and the answers obtained to the research questions are summarized in *Table no. 1* and *Table no. 2*.

3.1. The technological context

For this aspect we used Research question no. 1: "From a technological point of view, are Romanian companies in the financial sector ready for the adoption of AI?"

The technology background is divided into *Technology Readiness* and *AI Features*. *Technological Preparation* represents the companies' internal technologies. *AI features* are external technologies provided by technology provider companies.

Technological preparation

In the technology context, looking at external technologies, we can see that there are enough AI solutions in the market that are being used by companies and have really helped them perform better.

In the case of internal technologies, companies have the necessary physical infrastructures and most are at least digitized and automated, and 50% also use AI solutions. At least half of the company's data is stored in the cloud from external providers.

AI Features

AI solutions are expensive in the short term, but in the long term they will provide cost savings. These solutions have a lot of benefits that are very well known by the respondents, such as: shorter processing time, higher efficiency, higher accuracy, higher quantity and quality of processed data. Technological readiness will increase in case of its adoption by companies and this will help them adopt new technological solutions more quickly and easily.

3.2. The organizational context

For this aspect, we used Research question no. 2: "From an organizational point of view, are Romanian companies in the financial sector prepared for the adoption of AI?"

The organizational context is divided into *Organizational Preparation* and *Top Management Support*.

Organizational training

Managers and executives believe that jobs involving repetitive tasks will be replaced by AI solutions in the next 10 years. Managers who have had the chance to be part of a High-Tech organization already use AI solutions and know very well the advantages and opportunities created by these technologies. They also know that the human factor will not be fully replaced by technology, but the lack of adequate knowledge in using AI solutions and also in conducting financial activities is a threat.

Management support

Managers and directors who are part of High-Tech companies must be prepared for the implementation of new technological solutions if this is a decision taken by the group. In most answers, the conclusion is that managers are interested in reducing costs and saving time, team managers do not always agree with new solutions that want to reduce the number of jobs.

3.3. Environmental context

For this aspect, we used Research question no. 3: "From an environmental point of view, are Romanian companies in the financial sector ready for the adoption of AI?" and is

divided into two subcategories: *Industrial Features* and *Government Regulations*.

Industry characteristics are also an important factor for analyzing the implementation of AI solutions. In addition to the available solutions and the ability of companies to use them, they are also influenced by other external factors. Competition is an important one because a company that is able to double its work capacity and simplify customer interaction will surely win more customers. Employees are willing to work for companies that understand the importance of AI solutions, especially for young employees who have grown up in such an environment and easily get bored with repetitive tasks. They also change jobs very often if they don't like them.

Customers are interested in having an easy interaction with financial companies. They want to upload documents like invoices online because it's easier and faster. They also want to receive advice for important decisions they make, such as company development.

Government regulations

The change in legislation is still an impediment even after the pandemic crisis, when the ghiseul.ro platform was used by 1 million Romanians to pay taxes online and other digitization actions were taken.

The Romanian state was keen to support the continuity of business activity during the pandemic in a telework context, by introducing the Digital Signature at the beginning of 2020, through OUG no. 38/2020. After this decision companies were able to interact with customers using online documents. This is a first digitization step, which will support the following processes of automation of legislative processes.

In the area of financial services, respondents consider the change in legislation as an impediment to the introduction of AI solutions. This situation is explained in the following answer: "*Month by month ANAF adds a new feature to the legislation. Software companies have to make changes every month based on new legislation.*"

Other respondents found that although the process of digitalization of legislation has started and is in continuous evolution, they still have to physically go to the counters for some activities, such as setting up a company.

Table no 1. Challenges faced by financial and accounting services	
Technological context	
Technological readiness	1. In Romania there are qualitative and available professional training sources (ACCA, CECCAR, free courses offered by Microsoft and other companies). 2. Romania is well known for having well trained IT people. 3. People are informed about the advantages and disadvantages of using AI solutions from the company or through their own decision to prepare for a new work reality.
AI Characteristics	4. AI solutions may seem expensive in the short term, but in the long term the result will be cost reduction. 5. AI solutions will bring efficiency, reduction of working time and costs, a smaller number of errors, more amount of processed data, more complex reports and higher profit because it will allow the company to have more customers. 6. On the Romanian market there are enough technology providers that have AI solutions in their portfolio and case studies with success stories in companies from the financial sector.
Organizational context	
Organizational readiness	7. Managers consider it necessary for an employee to use analytical and critical thinking for new roles. They must also have technological skills along with communication and sales skills and theoretical knowledge of accounting. 8. In addition to the workforce, company representatives must also know how to properly manage financial resources, this being a factor that slows down the process of implementing new solutions.
Top management support	9. More than 65% of top management and executives are open to implementing AI solutions. They already know from the organization or from their own experience the benefits of AI and are able and willing to provide support to employees involved in this process. The rest of the managers are not yet open to adopting AI solutions.
Environmental context	
Industrial Characteristics	10. The most important acceleration drivers of the adoption of AI solutions are: competition, more customers, mindset and desire to grow, available technology, higher workload, times of crisis, war, telecommuting, the need for hire fewer people.
Governmental Regulations	11. Romanian legislation is constantly changing. Digitization projects are underway and in 75% of cases legislation is considered not to prevent the adoption of AI solutions, but to slow it down.

Source: Author's representation using TOE framework

To help the financial sector eager to implement AI solutions, we have developed a practical guide using the T-O-E Framework. The first step, as mentioned, was to conduct a literature review using the T-O-E Framework. For this we used a

structured interview with 29 financial specialists and technological service providers with managerial and executive roles in their companies, some of them with Romanian capital and multinationals, presented in **Appendix A**.

Table no. 2. Practical guideline for accounting companies	
Technological context	
Technological readiness	<p>1. There are enough AI solutions available on the Romanian market and abroad. As a country, Romania is well known for its talented IT workforce and IT companies that are now expanding globally. The largest of them in 2021, UiPath, the Romanian unicorn, is now located in the United States.</p> <p>2. IT companies offer software, infrastructure, customized solutions, maintenance, free courses.</p> <p>3. If company representatives have an IT department and enough resources for research and development, they can develop their own AI solutions.</p>
AI Characteristics	<p>4. Managers and executives open to change find AI solutions a great alternative for repetitive tasks. They know the benefits and are willing to bring such alternatives for junior roles. But they must also prepare the workforce for this decision. The rest of the managers who implement new solutions if the decision comes from the group level must provide the employees with the necessary support to adapt to the changes.</p>
Organizational context	
Organizational readiness	<p>5. Businesses need to hire and invest in workforce skills, such as technology skills, and there are already many companies doing this. They must ensure the transition to AI in an ethical and cyber-secure manner.</p> <p>6. He also needs to find and balance the company's resources: financial, manpower, technological.</p>
Top management support	<p>7. The company's top management must allocate the necessary budget for the implementation of AI solutions in their companies in advance and have a very clear long-term implementation and maintenance plan.</p>
Environmental context	
Industrial Characteristics	<p>8. Employees must be informed about the benefits of AI solutions.</p> <p>9. Companies need to look carefully at their competitors as AI solutions provide them with a lot of support to grow rapidly.</p> <p>10. Businesses need to ask their customers what they need from them at the end of the month and what additional services and support they need to grow and are willing to pay for. In an era of speed, no one can afford to waste time and resources.</p>
Governmental Regulations	<p>11. The financial and technological sector must create space for innovation, constantly adapting to legislative changes.</p>

Source: Author's representation using TOE framework

Conclusions

According to the T-O-E Framework, the bottom line is that the decision to implement an AI solution is very complex and must take into account a big picture of the business and the environment. Company representatives must look from the point of view of technological readiness at: employee knowledge, available physical infrastructure and financial resources.

From an AI Features perspective, company representatives need to find a custom AI solution provider that best fits their needs and available resources. The companies providing technological solutions are both global and local in a very large number and the solutions offered are very well tested and yield results. Of course, the prices are commensurate with the solutions and support that companies need for: implementation, maintenance, constant support, training for employees.

The Organizational Context considers the management's ability to properly use the company's resources to increase profit. It also studies the level of openness of

management to adopt new technological solutions to increase the company's productivity and reduce costs.

The Environmental Context also affects companies and is equally important in the analysis of a company that wants to implement new technology solutions. Companies cannot afford to just let competitors adopt solutions that increase their work capacity because they risk losing customers or not providing them with the services they need.

The limitations of the study are given by the small number of respondents.

For this research, the next step is to create a questionnaire that will be distributed to companies in the financial sector with CAEN Code 692 - Accounting and financial audit activities; tax consultancy. With the help of this questionnaire, we aim to study how the level of implementation of AI solutions is determined by the technological, organizational and environmental contexts. As a representative sample, we aim to obtain a minimum of 130 responses, representing the largest Romanian companies in the financial field.

REFERENCES

1. ACCA, (2020). The passionate practitioner: Developing the digitalised small and medium practice, available at: <https://www.accaglobal.com/lk/en/professional-insights/technology/passionate-practitioner.html>.
2. Andrews, W. (2017). Where You Should Use Artificial Intelligence and Why. *Gartner Report*, available at: <https://www.gartner.com/en/documents/3754164>
3. Khan, M., Jan, B., Farman, H., (2019). Deep Learning: *Convergence to Big Data Analytics*, Springer, Chapter 3, p. 31
4. AlSheibani, S., Cheung, Y. (2018). Artificial Intelligence Adoption: AI-readiness at Firm-Level, *Twenty-Second Pacific Asia Conference on Information Systems*, Japan
5. Baker, J. (2011). The Technology-Organization-Environment Framework, în cartea: „Information Systems Theory”, Cap.12, *University of Hamburg*, Germania, p. 231-245
6. Cutting, G. A., Cutting-Decelle, A. F. (2021). Intelligent Document Processing - Methods and Tools in the real world, *Computer science*, p. 1-27 https://www.researchgate.net/publication/357417608_Intelligent_Document_Processing_-_Methods_and_Tools_in_the_real_world/link/61ce018ada5d105e550aa2ee/download
7. Chen, N., Christensen, L., Gallagher, K., Rosamond, M., and Rafert, G. (2016). *Global Economic Impacts Associated with AI*, United States, p.1, https://www.analysisgroup.com/uploadedfiles/content/insights/publishing/ag_full_report_economic_impact_of_ai.pdf
8. Haq, I., Abatemarco, M., Hoops, J. (2020), The Development of Machine Learning and its Implications for Public Accounting, *The CPA Journal*, <https://www.cpajournal.com/2020/07/10/the-development-of-machine-learning-and-its-implications-for-public-accounting/>
9. IFAC, (2020). ACCOUNTANCY SKILLS EVOLUTION: IMPACT OF COVID-19 & THE PATH FORWARD, <https://www.ifac.org/knowledge-gateway/preparing-future-ready-professionals/discussion/accountancy-skills-evolution-impact-covid-19-path-forward>

10. Inn, L. (2016). Fintech: Ecosystem and Business Model, *Advanced Science and Technology Letters*, Vol. 142, UNESST, 2016, pp. 57-62
11. Kruse, L., Wunderlich, N., Beck, R. (2019) Artificial Intelligence for the Financial Services Industry: What Challenges Organizations to Succeed, *Proceedings of the 52nd Hawaii International Conference on System Sciences*, https://www.researchgate.net/publication/328215951_Artificial_Intelligence_for_the_Financial_Services_Industry_What_Challenges_Or_ganizations_to_Succeed/link/612e3a1a0360302a006ed3cf/download
12. Luo, J., Meng, Q., Cai, Y. (2018). Analysis of the Impact of Artificial Intelligence Application on the Development of Accounting Industry, *Open Journal of Business and Management*, 6, 850-856
13. Lin, P., Hazelbaker, T. (2019). Meeting the Challenge of Artificial Intelligence: What CPAs Need to Know, *The CPA Journal*; New York, Vol. 89, Iss. 6, June: 48-52.
14. Mei, J., Islam, A., Wu, Y., Moh'd A., Milios E. (2016). Statistical learning for OCR text correction. *Computer science*. (PDF) Statistical Learning for OCR Text Correction (researchgate.net)
15. Massaro, M., Dumay, J. & Guthrie, J. (2016). On the shoulders of giants: undertaking a structured literature review in accounting. *Accounting, Auditing & Accountability Journal*, 29 (5), 767-801.
16. Stoica, O. C., Ionescu-Felegă, L. (2022), Accounting and Auditing Profession in the Era of Digitalization, *Audit Financiar*, vol. XX, no. 1(165)/2022, pp. 134-146, DOI: 10.20869/AUDITF/2022/165/003
17. Tornatzky, L. G., & Fleischer, M. (1990). The processes of technological innovation. *Lexington, MA: Lexington Books*.
18. Zhu, K., Kraemer, K.L., Dedrick, J. (2004). Information Technology Payoff in E-Business Environments: An International Perspective on Value Creation of E-Business in the FS Industry, *Journal of Management Information Systems*, Vol. 21, 2004, pp. 17

Appendix A. Interview respondents

No	Role in the company	Activity field	No. of employees
1	CEO	Financial services provider	Over 250
2	IT Section Leader RPA	IT Provider	Over 250
3	Managing partner, administrator	Financial services provider	Between 10-50
4	Business owner, Auditor	Financial services provider	Between 10-50
5	Team manager accounts payable	Financial services provider	Over 250
6	Executive finance director	Financial services provider	Over 250
7	RPS & Financial analyst	Financial services provider	Over 250
8	Financial Analyst	Financial services provider	Over 250
9	Owner and administrator	Financial services provider	Between 10-50
10	Enterprise resource planning project manager	Financial services provider	Over 250
11	Independent M&A director	Financial services provider	Over 250
12	Deputy manager in M&A	Financial services provider	Over 250
13	CEO, Founder	IT Provider	Between 10-50
14	RPA manager	IT Service Provider	Over 250
15	Financial Systems Manager	Financial services provider	Over 250
16	CEO, robot's programmer, assistant professor	IT Provider	Over 250
17	Managing partner	Financial services provider	Over 250
18	CEO, owner	Application developer and business owner	Over 250
19	Managing partner, senior	Financial services provider	Over 250
20	CEO	Financial services provider	Between 10-50
21	Managing partner and accounting expert	Financial services provider	Over 250
22	Managing partner	Financial services provider	Over 250
23	Manager	IT provider	Over 250
24	Audit manager	Financial services provider	Over 250
25	RPA manager	IT provider	Between 10-50
26	IT section manager	IT provider	Over 250
27	Manager RPA	IT provider	Over 250
28	Acquisitions manager	IT provider	Over 250
29	Program development manager	IT provider	Between 10-50

The Transparency of the Supreme Audit Institution in the Republic of North Macedonia through the Analysis of Official Website Traffic

Research and Teaching Assistant Ivan DIONISIJEV,
Ph.D. Student, Ss. Cyril and Methodius University in
Skopje, Faculty of Economics,
e-mail: ivan.d@eccf.ukim.edu.mk

Research and Teaching Assistant Todor TOCEV,
Ph.D. Student, Ss. Cyril and Methodius University in
Skopje, Faculty of Economics,
e-mail: todor.tocev@eccf.ukim.edu.mk

Abstract

Transparency refers to unrestricted public access to timely and reliable information about decisions and performance in the public sector. Supreme Audit Institutions as independent institutions, according to professional regulation, are obliged to be transparent to all stakeholders and the general public. Hence, this paper analyzes the transparency of the State Audit Office, as the Supreme Audit Institution in the Republic of North Macedonia through its official website and annual visits by all interested parties. Two independent variables are included in the research: the budget and the change of management from the existence of the State Audit Office until today, to determine if they correlate with the number of visits to the website. To determine the relationship between the variables, a correlation matrix was used, and the data was processed through the SPSS software. The obtained results indicate a strong positive correlation between the determined variables.

Key words: transparency; State Audit Office; website; website visits;

JEL Classification: H83, M42

To cite this article:

Dionisijev, I., Tocev, T. (2023), The Transparency of the Supreme Audit Institution in the Republic of North Macedonia through the Analysis of Official Website Traffic, *Audit Financiar*, vol. XXI, no. 2(170)/2023, pp. 331-339, DOI: 10.20869/AUDITF/2023/170/012

To link this article:

<http://dx.doi.org/10.20869/AUDITF/2023/170/012>
Received: 16.12.2022
Revised: 30.01.2023
Accepted: 6.02.2023

Introduction

The Supreme Audit Institutions (SAI) are independent organizations responsible for auditing the financial activities of the government. Transparency is crucial for Supreme Audit Institutions to function effectively. In terms of website information, SAIs typically provide information about their mission, history, and organizational structure. They also publish reports, press releases, and other information about their audits and findings. Many Supreme Audit Institutions also have a searchable database of audit reports, so that the public can access information about government spending and performance.

SAIs are typically committed to transparency and open access to information. As such, their websites often include information about how to submit a Freedom of Information request, and how to get in touch with their public relations or outreach team. The websites of Supreme Audit Institutions are an important resource for citizens who want to understand more about how their government is using public funds, and for watchdog organizations that monitor government activities.

The International Organization of Supreme Audit Institutions (INTOSAI) has established the INTOSAI-P 20 Principles of Transparency and Accountability, which outlines 9 key principles for promoting transparency and accountability in the work of the SAI. One of the main principles, Principle 8, emphasizes the need for SAIs to promptly and comprehensively inform the public about their activities and audit results through various channels such as media and their official website.

INTOSAI has also issued the Guideline 9040 on Good Practices Related to SAI Transparency, which highlights the importance of having a well-designed website and the information it should provide.

This research paper aims to examine the transparency of the State Audit Office of the Republic of North Macedonia (SAO) by analyzing the annual visits to its official website (www.dzr.mk). The paper is divided into several sections, including a literature review, analysis of SAO transparency, research methodology, results, and discussion, and concludes with findings and limitations. This paper is unique in that it specifically investigates the transparency of the SAO through the annual visits to its website, whereas other related publications focus on transparency and communication of SAIs from different perspectives.

1. Literature review

Many authors have discussed how the internet has improved the interaction, openness, and transparency of public sector organizations (La Porte, Demchak, and Friis, 2001; Demchak, Friis, and La Porte, 2000; Drüke, 2007; La Porte, Demchak, and De Jong, 2002), and all of these aspects are seen as beneficial qualities to increase citizen trust in governments (Demchak, Friis and La Porte, 2000; Kim et al. 2005). According to Grimmelhuijsen (2012), transparency is defined as "the availability of information about an organization or actor allowing external actors to monitor the internal workings or performance of that organization" and it is also emphasized as a crucial component of successful governance (Kim et al. 2005). By being transparent, "the veil of secrecy" is lifted (Davis, 1998).

Though the SAIs play a significant role in fostering openness in the public sector, their effectiveness is occasionally questioned, particularly in nations where their message is not sufficiently clear and is not reaching the decision-making bodies (Codorean and Tudor, 2019). Therefore, SAIs must develop communication methods to improve their transparency in order to promote the transparency of SAIs, who must already be as transparent as feasible (González, López and García, 2008)

SAIs can use different communication channels to ensure their message reaches the right stakeholders - media, internet, conferences, public relations publications such as brochures and books, as well as videos and specialized publications, relations with other institutions, and sponsorships. The choice of one channel over another or the use of several channels will depend on the type of message, its content, available resources, and how stakeholders want to receive the information (Bennett and Jessani, 2011). The media and the Internet will be the two main channels through which the SAI will send its message to different audiences and be in touch with them. González, López and García (2008) point out that the communication plans of SAIs depend, to a large extent, on the media and the website to publish the results of their activity and to provide users with an overall view of their work.

It should also be noted that relations with the media also take place through SAI websites. Several SAIs have designed their websites so that part of the available space is dedicated to the media. In "Better Access, Better Information, Better News: The Ten Essential Elements of

an Online Newsroom", Bransford (2001) point out that the best way to ensure that journalists get the right message is to set up an online newsroom with direct access via a website.

The Canadian SAI has a media room that contains information on new releases, press releases related to reports, statements to parliamentary committees, statements to senate committees, statements to territorial legislative assembly committees, and speeches. The Italian SAI has a system known as "comunicazione" (eng: *communication*), which allows journalists to register and receive press releases and newsletters by email. The French SAI has a media area called "presse" (eng: *press*), which offers press files, statements, speeches, summaries of reports, articles, and various publications. The website of the Norwegian SAI has a press release file, while other SAIs that also have media space on their websites are those from Estonia, Mexico, Sweden, and the USA. They all have direct access to the media room from the main site, suggesting that the media is considered a primary audience (Callison, 2003) as well as being one of the main communication channels along with the Internet.

The World Wide Web (www) is a useful tool for assessing the openness and accountability of public organizations and for improving their transparency and accountability (Drüke, 2007; La Porte, Demchack, and De Jong, 2002). In the current communication context, information, and communication technology has enabled SAIs to promote accountability and transparency of public spending, drive efficiency in government operations, and offer electronic services by publishing audit reports on the website and using them to convey to their mandate, mission, operations, performance, costs, and impact, as well as other aspects of their work (INTOSAI, 2005). According to the latest research data, SAIs have the ability to have websites, however, 64 out of 188 INTOSAI members do not have a website. Overall, 51% are in Africa, 17.18% in South/Central America, 15.63% in Oceania, 9.3% in Asia, and 6.25% in Europe (González, López and García, 2013). Those who have websites offer different types of information in easily accessible formats. Users can obtain non-

financial information that answers questions such as the following: Who are we? What do we do and how do we do it? What are our products? Other types of information available are audit reports, annual reports, official publications, details of seminars and conferences they organize and/or participate in, and information directed at the media (González, López and García, 2008).

SAI's financial information refers to audit and annual activity reports. Most websites have a specific section dedicated to reports on organizations that have been audited. The reports are published in their entirety along with summaries and related press releases. Some websites (SAIs in the US, Australia, Canada, Spain, Norway, New Zealand, and the United Kingdom) have a report search engine that allows users, some more easily than others, to search for reports by date, topic, or portfolio. Estonia and Finland distinguish between different types of audits, while others have a drop-down menu containing reports by year but not classified (Bulgaria, China, Denmark, and Iceland), or, in the case of Hungary, by dates. It is important that SAIs do more than just publish audit reports on their websites. Nicoll (2005) believes that they should come up with new formulas for reporting and communicating opinions about their audits in collaboration with their representatives, the legislature, and the government. It is customary for SAIs to report on the methodology of their work. Some, such as Australia, report on audits to be submitted, offering details of the agencies involved and the purpose of the audit. As for the annual report, SAIs tend to include those spanning several years and locate them in the "Publications" or "About Us" sections. Additional information intended for different audiences appears on SAI websites - publications such as manuals, work directives, tools, manuals, codes of ethics, etc.

Websites offer SAIs the ability to target individual members of their overall audience and interact with them depending on their information needs. When talking about the media, it was previously pointed out that SAIs communicate with them through press releases and press conferences and make available content such as audits and annual reports. All this information is also available on their websites, usually in an area specifically dedicated to the media. The websites of some SAIs are designed according to different target

groups and their information requirements. The Estonian SAI offers audited entities and the media a space in which information differs: The former receive information about the rights and obligations of the SAI, the audit schedule, and regulations, as well as several publications related to its work; news and videos are provided to the media. The Italian SAI makes a distinction between citizens, Parliament, and the media; in Mexico there is a space for children - a multimedia video to explain the role of the SAI and the meaning of responsibility; The UK SAI provides an area for Parliament which contains audit reports, highlighting the latest as well as information on work in progress

González, López and García (2013) conclude that more recently, SAI websites have begun to improve their presentation and offer services to target groups by implementing Web 2.0 technology which, in turn, served as a springboard for the development of social media. They are still almost unused now and are limited to using feeds so that subscribers can receive press releases online. The presence of SAIs in the social network, such as Facebook or Twitter, is practically non-existent, except in a few cases, such as the GAO and the Australian and Estonian SAIs, but this also includes the State Audit Office, which has recently actively used the official Facebook page through which the activities of the SAO are reported.

Furthermore, change management is a systematic approach to dealing with the transition or transformation of an organization's goals, processes, or technologies. This kind of change refers broadly to the actions the company takes to change or adjust a significant component of its organization. This may include company culture, internal processes, underlying technology or infrastructure, corporate hierarchy, transparency, or another critical aspect (Miller, 2020). When going through big changes, especially management changes, it's really important for companies to just be more transparent in their work. There is always a certain tension during a change of management, but in that case, it is best

to just start leading with more transparency (Emanuele, 2022).

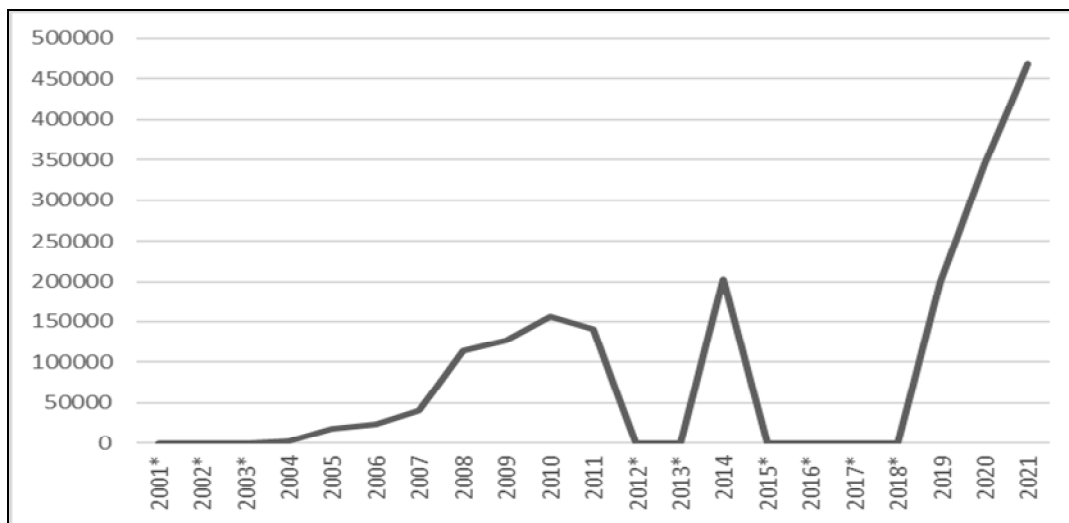
Dionisijev et. al (2022) in their research on the development of the supreme audit institution in North Macedonia leave a lot of room for determining factors that influence the development of certain segments of the functioning of the SAO, including transparency. With the same research, the SAO's budget was determined as a variable and it was tested which segments it affects, that is, that it has a positive correlation with the organizational size of the SAO, but not with the number of conducted audit engagements. In this research, it will be determined whether the SAO budget is statistically correlated to an increase/decrease in SAO transparency.

Finally, the Center for Economic Analysis (2020) has issued a Report on the transparency of the work of the SAO, which states that the new website of the SAO enables an easier review of documents, especially audit reports, which can be searched by year, type of audit and subject and also, submitting a Review Request is simple, on an easily visible part of the page and in a standardized form that will help anyone interested in structuring their Request. SAO has improved the approach of the website, highlighting and increasing the number of designated persons for contact with the public and the media, it can be concluded that SAO's communication with stakeholders is one of the priorities of the supreme institution (Center for Economic Analysis, 2020).

2. Analysis of the annual visits on the official website of the state audit office

The paper considered three variables for the purpose of its research, as outlined in the literature review: SAO Transparency represented by annual website visits, the approved budget of the SAO, and changes in management from 2001 to 2021. The graph in *Figure no. 1* illustrates the trend of annual visits to the SAO website from 2001 to 2021.

Figure no. 1. Annual visits to the official SAO's website



* no data available

Source: Author's calculation, 2022

The number of visits to the website has been steadily increasing, particularly from 2018 onwards. However, there is no data on the annual number of visits to the website in the first three years of the SAO's operation (2001, 2002, and 2003), as the annual reports don't include that information, although in the reports there is a special part titled "Notification of the SAO's work". Furthermore, in 2004, the same part was titled "Notification and information about the work of the SAO" and within these activities, it was notified that the SAO is expanding the reporting on its official website, which functions as an official website beginning from July 2003, and in December 2004 it was redesigned. In 2005, the SAO transparency in the annual report was expressed in the part titled "Relations and communication with the public", and already in 2006 and 2007, the part "Notification and information about the work of the SAO" is found again in the annual reports, where in 2007 it is indicated that within the framework of a twinning project with the Dutch Court of Audit, the SAO Communication Strategy 2008-2012 was prepared.

With the change of management at the end of 2007, the structure of the Annual Reports of the SAO drastically changes, and already in the coming years there is a special point in part that refers specifically to "Transparency of the SAO". In 2012, a new website was

designed and put into use, which replaced the existing one and introduced a new, more modern visual appearance and new content, as well as a new way of presenting data. However, in the annual reports of the SAO, in the point of transparency for the years: 2012, 2013, 2015, 2016, and 2017, no data could be found about the annual number of visitors to the website. At the end of 2017 and throughout 2018, there was a change of management in the SAO, and with the analysis of the annual report for 2018, it can be concluded that the SAO Transparency was completely rejected from the report and there is no data on the communication and information of the SAO.

Already by 2019, with new management, the whole situation has changed, i.e., in the annual reports appeared a new part entitled "Communication, transparency, and accountability of the SAO" (in 2019), "Communication and transparency in the operation of the SAO" (in 2020) and "Transparency and cooperation" (in 2021). On **Figure no. 1** a significant increase in the number of annual visits to the SAO website can be observed, considering that in December 2019 it was redesigned and greatly improved. In the latest report of the SAO, the opening of the Facebook page, which is on the rise, as well as the frequent updating of the content of the YouTube channel of the SAO, is also noted.

3. Research methodology

This research used secondary data collected from the SAO's website (www.dzr.mk) and its annual reports on work and performed audits from 2001 to 2021 to study the transparency and communication of the SAO with stakeholders. The literature review and previous analysis emphasized the significance of transparency in the SAI, and the research provides a comprehensive understanding of the SAO's transparency and communication through its website and annual visits. The research also examines the approved annual budget of the SAO from 2001 to 2021 and changes in management over time. Hence, the research tries to answer the following research question:

RQ: Is there a correlation between the budget and management change of the SAO and the level of

transparency observed through annual website visits?

Table no. 1 provides an overview of the variables along with their abbreviations and their measurement. To measure the SAO's transparency, the absolute number of annual visits to the website per year is used. These data are extracted from the annual reports on the work of the SAO from 2001 to 2021. Furthermore, the absolute amount of the approved budget of the SAO per year is used to measure the Budget variable. Finally, the measurement of the change of management is made with a value of 1 to 5 in SPSS software as follows: (1) for management from 2001 to 2005, (2) for management from 2006-2007, (3) for management from 2007 to 2017, (4) for the management from 2017 to 2018 and (5) for the management from 2019 to the present.

Variable	Abbreviation	Measurement
SAO's transparency	TRANSPARENCY	Annual visits to the website (2001 to 2021)
SAO's budget	BUDGET	The absolute amount of the approved budget of the SAO (2001 to 2021)
Change of Management	MAN_CHANGE	(1) for management from 2001 to 2005, (2) for management from 2006 to 2007, (3) for management from 2007 to 2017, (4) for management from 2017 to 2018 (5) for management from 2019 to the present

Source: Author's text, 2022

The data collected were analyzed using SPSS software, with descriptive statistics to summarize the data and Spearman rank-order correlation to determine the relationship between variables. The Spearman rank-order correlation was chosen because it is a non-parametric method of measuring the association between two ranked variables. It measures the monotonic relationship between two variables and has been used in previous research

(Haşiloğlu and Kunduracı, 2018; Kossowski and Hauke, 2012; Dionisijev et al., 2022) to identify positive or negative correlations between established variables.

4. Results and discussion

First, the data were analyzed through descriptive statistics, for which **Table no. 2** shows the obtained results.

	N	Minimum	Maximum	Mean	Std. Deviation
TRANSPARENCY	15	0	468000	122519.60	138782.948
BUDGET	15	354280	1941659	1419134.02	435086.401

Source: Author's calculation, 2022

Namely, from the descriptive statistics, it can be noted that the maximum number of annual views of the SAO's website since its existence until today is 468,000 views, while the average value is 122,517 views. Regarding the budget, the minimum approved budget of the SAO is 354,280 euros, and the maximum reaches almost 2 million

euros, or more precisely 1,941,659 euros.

Furthermore, to answer the research question, a Spearman rank-order correlation was made to show what relationship (correlation) there is between the transparency and budget variables. **Table no. 3** presents the obtained results.

Table no. 3. Spearman rank-order correlation for the SAO's transparency and the SAO's budget

			TRANSPARENCY	BUDGET
Spearman's rho	TRANSPARENCY	Correlation Coefficient	1.000	.832**
		Sig. (2-tailed)		.000
		N	15	15
	BUDGET	Correlation Coefficient	.832**	1.000
		Sig. (2-tailed)	.000	
		N	15	15

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Author's calculation

As can be seen from the table, there is a strong positive correlation between the established variables, $r(15) = .832, p = .000$. This would mean that with each increase in the SAO's budget, there is a strong relationship with an increase in SAO's transparency expressed through the annual number of visits to the official website.

Furthermore, the relationship between the variables of transparency, and change of management was tested. **Table no. 4** shows the obtained results, which again indicate a strong positive correlation between the established variables.

Table no. 4. Spearman rank-order correlation for the SAO's transparency and the change in management

			TRANSPARENCY	MAN_CHANGE
Spearman's rho	TRANSPARENCY	Correlation Coefficient	1.000	.941**
		Sig. (2-tailed)		.000
		N	15	15
	MAN_CHANGE	Correlation Coefficient	.941**	1.000
		Sig. (2-tailed)	.000	
		N	15	15

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Author's calculation

Namely, the obtained result for the positive correlation, $r(15) = .941, p = .000$, proves that with the change of management in the SAO from its existence until today, there is a strong positive correlation in terms of increasing

transparency, thus confirming the conclusion expressed above in the paper, where **Figure no. 1** shows a growing trend in annual visits to the website, especially with the last SAO management from 2019 to the present.

Conclusion

Transparency in the operation of SAIs plays a vital role in ensuring their impartiality and credibility. The presence of an effective and functional SAI website can be seen as an indicator of transparency. The website should provide comprehensive information on the activities, responsibilities, and goals of the SAI, as well as the outcomes of its audits and investigations. The frequency of website visits by various stakeholders, including government officials, audited entities, and the general public, can also serve as a measure of the transparency of the SAI. The availability of information on the SAI's website can improve accountability, enhance public trust, and increase the impact of the SAI's work. Additionally, an effective and user-friendly website can facilitate communication between the SAI and other entities, such as the media and the public.

In the Republic of North Macedonia, this is the only paper so far that refers to the given problem and that analyzes the transparency of the SAO from its existence until today, through the communication of the official website expressed through annual visits by all interested parties. Two independent variables are included in the paper: the budget and the change of management, to determine their relationship with transparency. Both variables have been shown to have a strong positive correlation with transparency.

A limitation of this paper is the lack of certain data in the annual reports of SAO for certain years. Also, this paper leaves a lot of room for further research in the area of SAO transparency, focusing on other aspects, not only on annual website visits, by determining additional variables that could have a significant impact on it.

REFERENCES

- Bennett, G., and Jessani, N., (2011). The knowledge translation toolkit: Bridging the know-do gap: A resource for researchers. New Delhi, India: SAGE, available at: <https://www.idrc.ca/en/book/knowledge-translation-toolkit-bridging-know-do-gap-resource-researchers>
- Bransford, K., (2001). Better access, better information, better news: The ten essential elements of an online newsroom, available at: <http://riverkeeperpressroom.gmtmedia.org/sites/default/files/TenElements2ndEd.pdf>
- Callison, C., (2003). Media relations and the Internet: How Fortune 500 company web sites assist journalists in news gathering. *Public Relations Review*, vol. 29, no. 29-41. doi:10.1016/S0363-8111(02)00196-0
- Center for Economic Analysis, (2020). Report on the transparency of the work of the SAO, Republic of North Macedonia, available at: https://cea.org.mk/wp-content/uploads/2020/05/Transparentnost-na-DZR-2020_final.pdf
- Codorean, D., and Tudor, T., A. (2019). Using Social Media to Increase Transparency of Supreme Audit Institution, *Conference Proceedings – Transylvanian International Conference in Public Administration*, pp. 74-98.
- Davis, J. (1998). Access to and Transmission of Information: Position of the Media, in Deckmyn, V., and Thomson, I. (eds), *Openness and Transparency in the European Union*, Maastricht, pp. 121-126.
- Demchak, C. C., Friis, C. and La Porte, T. M., (2000). Webbing Governance: National Differences in Constructing the Public Face, *Handbook of Public Information Systems*, New York, pp. 179-196.
- Dionisijev, I., Bozhinovska Lazarevska, Z., Trpeska, M. and Atanasovski, A. (2022), The supreme audit institution in the Republic of North Macedonia – two decades of building public trust, *Journal of Public Budgeting, Accounting & Financial Management*, Vol. ahead-of-print No. ahead-of-print. <https://doi.org/10.1108/JPBAFM-08-2021-0129>
- Drüke, H., (2007). Can E-Government make public governance more accountable?, *Performance accountability and combating corruption*, pp. 59-88, Washington, DC: The World Bank, DOI: 10.1111/j.1468-0491.2004.00246
- Emanuele, G. (2022). How to Approach Change Management with Transparency, available at: <https://galenemanuele.com/blog/change-transparency>
- González, B., García, R., and López, A. (2013). Communication as a Transparency and

- Accountability Strategy in Supreme Audit Institutions, *Administration & Society*, vol. 45, no.5 pp. 583-609, DOI: 10.1177/0095399712438376
12. González, B., López, A., and García, R., (2008). Supreme Audit Institutions and their communication strategies, *International Review of Administrative Sciences*, vol. 74, pp. 435-461. DOI:10.1177/0020852308095312
 13. Grimmelikhuijsen, S.G. (2012). Transparency and Trust. An Experimental Study of Online Disclosure and Trust in Government, available at: <https://www.semanticscholar.org/paper/Transparency-and-trust.-An-experimental-study-of-in-Grimmelikhuijsen/80c2552b8df4f45b4093f281d589f2ad37eaf7ee>
 14. Haşiloğlu, A., M., and Kunduracı, A., (2018). A Research Study on Identifying the Correlation between Fourth Graders' Attitudes and Behaviors toward the Environment, *International Education Studies*; Vol. 11, No. 6, pp. 60-65
 15. INTOSAI, (2005). Report on the 18th UN/INTOSAI Seminar on Government Auditing. Vienna, available at: <http://www.intosai.org/uploads/3vn2005e.pdf>
 16. INTOSAI, (2019). GUIDE 9040 - Good-Practices-Related-to-SAI-Transparency, available at: <https://www.issai.org/wp-content/uploads/2019/08/GUID-9040-Good-Practices-Related-to-SAI-Transparency.pdf>
 17. INTOSAI, (2019). INTOSAI-P - 20 - Principles of Transparency and Accountability, available at: <https://www.issai.org/pronouncements/intosai-p-20-principles-of-transparency-and-accountability/>
 18. Kim, P. S., Halligan, J., Cho, N., Oh, C.H., and Eikenberry, A. M. (2005). Toward Participatory and Transparent Governance: Report on the Sixth Global Forum on Reinventing Government, *Public Administration Review*, vol. 65, no. 6, pp.646-654.
 19. Kossowski, T., and Hauke, J. (2012). Analysis of the labour market in metropolitan areas: a spatial filtering approach, *Quaestiones Geographicae*, vol. 31, no. 2, pp. 39-48.
 20. La Porte, T. M., Demchak, C. C., and De Jong, M., (2002). Democracy and bureaucracy in the age of the web: Empirical findings and theoretical speculations, *Administration & Society*, vol. 34, pp. 411-446. doi:10.1177/0095399702034004004
 21. La Porte, T. M., Demchak, C. C., and Friis, C., (2001). Webbing Governance: Global Trends Across National - Level Public Agencies, *Communications of the ACM*, vol. 44, no. 1, pp. 63-67.
 22. Miller, K., (2020). 5 critical steps in the change management process, available at: <https://online.hbs.edu/blog/post/change-management-process>
 23. Nicoll, P., (2005). Audit in democracy. The Australian model of public sector audit and its application to emerging markets, *Burlington, VT: Ashgate*, available at: <https://www.routledge.com/Audit-in-a-Democracy-The-Australian-Model-of-Public-Sector-Audit-and-its/Nicoll/p/book/9780367604240>

Organizational Practices Related to Internal Audit in Economic Entities from a Pandemic Perspective

Mihai-Daniel GAVRILĂ,
master student, Bucharest University
of Economic Studies,
e-mail: gavrilamihai17@stud.ase.ro

Alexandra ȘTEFAN,
master student, Bucharest University
of Economic Studies,
e-mail: stefan5alexandra@stud.ase.ro

Abstract

In the context of economic turmoil and the amplification and diversification of risks to which companies are exposed, internal audit plays an increasingly important role. This is enhanced by the inclusion of internal audit as a component of corporate governance, linked to the interests of investors and other stakeholders. The present research is two-dimensional: the first component includes a review of the literature on internal audit. The second component includes a qualitative research on the identification of organizational coordinates of internal audit at company level, in relation to specific regulatory requirements, in the pandemic period. The results revealed interferences and limitations with respect to compliance with regulated organizational practices on internal audit in relation to the sector in which companies operate.

Key words: internal audit; BET index; companies; Bucharest Stock Exchange; regulation;
JEL Classification: M48, M48, L21, G38

To cite this article:

Gavrilă, M.-D., Ștefan, A. (2023), Organizational Practices Related to Internal Audit in Economic Entities from a Pandemic Perspective, *Audit Financiar*, vol. XXI, no. 2(170)/2023, pp. 340-354, DOI: 10.20869/AUDITF/2023/170/013

To link this article:

<http://dx.doi.org/10.20869/AUDITF/2023/170/013>
Received: 28.02.2023
Revised: 2.03.2023
Accepted: 10.05.2023

Introduction

The research approach is based on the fact that the corporate governance system aims to improve the economic efficiency of companies by implementing the strategy of risk management mechanisms, understanding the importance of the quality of financial information and improving management.

Good governance prevents the occurrence of risks and mitigates the effects of their occurrence, while improving the performance of the entities that adopt it. Thus, internal audit is a key point in the conduct of a company's business as it systematically assesses the overall risk management mechanisms and corporate governance.

In this context, the research carried out aims to identify the organizational practices of internal audit at the level of listed companies, in relation to specific regulatory requirements, during the pandemic period. The choice of these companies took into account three coordinates: the quality of "benchmark" on the Romanian financial market; the fact that they are subject to more regulations compared to non-listed companies and are also regularly audited by regulators to monitor their compliance status; and the existence of an emerging market in Romania from 2020 onwards.

The paper is structured as follows: the first section presents the main ideas from the literature on internal audit; the second section includes the research methodology; the third section is dedicated to data processing and analysis; the last section presents the final conclusions of the study, limitations and future directions of the research.

Literature review

The concept of auditing was consolidated during the economic crisis of 1929 in the United States of America, when listed entities had to pay large sums to external auditors to express an opinion on their financial statements.

As a solution to reduce external audit costs, companies started to organize their own internal audit departments, which would take over the preparatory audit activities within the companies. External auditors are still used for financial statements.

Internal auditors were also used after the economic crisis had passed as they had knowledge and used techniques

specific to the financial-accounting field, their role increased, thus the need for standardization and organization of the practical activities carried out materialized. In 1941, the Institute of Internal Auditors (I.I.A.) was founded in Orlando, Florida, and was later joined by the United Kingdom, Sweden, Norway and other countries.

In the literature, internal auditing is approached from multiple perspectives.

Studies in the literature (Anderson, 2003) address the role and added value that internal audit brings to a range of users: managers, corporate governance structures, external auditors, customers, suppliers or regulators. Anderson refers to all of these users as "clients" and reveals that there are often tensions between them due to the different demands they place on internal auditors, as the objectives of each differ, and asks how balance can be achieved in this context.

Internal audit is increasingly expanding its scope, with consequences for the training and skills that internal auditors need to have in order to ensure that the activities they undertake meet the increasingly demanding requirements of companies (Ratliff and Reding, 2002).

Ghiță (2008) considers that internal audit, together with other elements such as internal control, risk management and financial management, are encompassed in the complex concept of corporate governance.

In Romania, the need for the internal audit function arose with the transition to a market economy, when entities began to be concerned with improving performance by increasing efficiency, effectiveness and economy, as well as the organization of management and internal control (Timofte, 2020).

The importance of internal audit in Romania manifested itself rather late, compared to other countries, due to factors such as the existence of the communist regime until 1989, but also to the economic difficulties generated after this period by the inability of governments to adopt measures appropriate to the economic conditions in the country.

Internationally, internal audit has evolved from large entities to the public sector, while in Romania, internal audit was first felt in public institutions (Boța-Avram and Popa, 2011), and as investment in the private sector has grown, the need for the internal audit function has also been felt in this area.

In our country, the internal audit activity is coordinated by the Chamber of Financial Auditors of Romania (CAFR) and the Association of Internal Auditors of Romania (AAIR). Thus, by the Decision of the Council of the Chamber of Financial Auditors of Romania no. 48/26 June 2014 for the adoption of the Binding Standards of the International Professional Practices Framework, issued by the Institute of Internal Auditors Global (IIA Global), 2013 edition, the Binding Standards of the International Professional Practices Framework (IPPF), issued by the Institute of Internal Auditors Global (IIA Global), 2013 edition, were adopted in full, with the acknowledgement of the IIA Global's copyright and the translation made by the Romanian Association of Internal Auditors (IIA Romania), with the following structure: (a) Definition; (b) Code of Ethics; (c) International Standards for the Professional Practice of Internal Auditing (Internal Auditing Standards). From this perspective, internal audit is defined as "an independent, objective assurance and advisory activity designed to add value and improve an organization's operations. It assists an organization in achieving its objectives through a systematic and methodical approach that assesses and improves the effectiveness of risk management, control and governance processes".

From the private sector perspective, the companies that are obliged to organize internal audit are the companies that, according to the Law no.162/2017 on statutory audit of annual financial statements and consolidated annual financial statements and amending some normative acts, are obliged to audit their annual financial statements, i.e. they are subject to statutory financial audit. Also, an important component that is obliged to organize internal audit is represented by the companies listed on the Bucharest Stock Exchange (BVB). They are obliged to report qualitative financial information, which is based on governance rules imposed both on companies listed on the stock exchange internationally and in Romania. Stock exchanges have developed practical guidelines and measured the level of disclosure both through their own departments and with the help of other organizations to determine the level of disclosure and compliance of listed entities with governance codes (Guan et al., 2016). Since 2019, the BVB has started to collaborate with the Association for Investor Relations at the Romanian Stock Exchange (ARIR) in order to determine communication practices in investor relations, as well as compliance with the Corporate Governance Code of the Bucharest Stock Exchange (Hațegan, 2020).

Another facet of internal audit is the internal audit committee. The results of research on the regulatory coordinates related to the internal audit committee in the public, private-non-banking and banking sectors (Ștefănescu and Țurlea, 2013) revealed homogeneous and non-homogeneous aspects of them. In the authors' view, audit committees are the foundation of corporate governance and generate added value through the transparency of financial reporting and the trust they provide to stakeholders.

Taking the evolution of internal audit as a starting point, Ratliff and Reding (2002) believe that auditors of our century need to have the knowledge to audit everything from operations to performance, but also to information systems, financial statements and compliance with the law, fraud detection, and the quality of information.

Also, Moeller and Witt (1999) are of the opinion that the successful internal auditor must possess a set of personal qualities that complement professional skills, such as integrity and fairness, modesty and calmness, perseverance, vigilance, energy, courage, and others.

With the technological revolution having a strong impact on business, Flemming Ruud (2003) states that the role of internal audit has evolved from that of an assurance service to that of an advisory service, as well as a new mission that internal auditors must assume, and the connections that they need to maintain and develop in relation to the governance structures of companies.

Just as internal audit is constantly evolving, so are software systems for use by companies. Thus, Enterprise Resource Planning (ERP) systems are complex systems designed to ensure the integration of data from several modules, such as production, purchasing, sales, finance, human resources, etc. (Eslam Nazemi et al., 2012).

ERP systems have many benefits (Ionescu and Igna, 2021), including: they are adaptable to the specific needs of companies depending on the field in which they operate; they integrate activities from several levels into a single database; they offer increased data security; the flow of manual data processing decreases and information is provided in real time; in terms of internal audit, the use of an ERP system increases the transparency of operations as well as the accuracy of the information generated.

Research objectives and methodology

The objective of the research is to identify the organizational coordinates of internal audit in companies listed on the Bucharest Stock Exchange (BVB) in view of their specific regulation requirements. In this regard, according to art. 65 of Law no. 162/2017, entities whose annual financial statements are subject, by law, to statutory audit are required to organize and ensure the exercise of internal audit activity. The regulations also require public interest entities to organize an audit committee.

Using qualitative research methodology, we analyzed the information presented in the Annual Report for 2021, available on the official websites of the companies listed on the BVB. The selection of the reference period was based on the availability of research data at the time of the study. In addition, 2021 was a challenging year for companies because in this pandemic period generated by COVID-19 and post-pandemic, companies had to adopt new working methods so that technological processes

would not be affected by the social protection regulations in force.

To this end, 30 BVB-listed companies were selected. The selection criterion for the companies was their inclusion in the stock market according to the BET index and the BETPlus index (11 companies in the sample).

The BET ("Bucharest Exchange Trading") index is the index that includes the most liquid companies listed on the BVB regulated market and also shows the most traded companies on this market, excluding financial investment companies.

The BETPlus index includes companies with minimum liquidity requirements and excludes financial investment companies.

The main coordinates considered in the research were: the existence of the Internal Audit department, the structure to which it is subordinated, the dissemination of information on the typology of audit assignments by them, the adoption of ERP-type systems in internal management and the anti-coverage measures adopted.

The list of companies included in the sample analyzed is shown in **Table no. 1**.

No.	Company name	Sector of activity
1	ALRO S.A.	Metallurgical industry
2	BANCA TRANSILVANIA S.A.	Financial, banking and insurance activities
3	TTS (TRANSPORT TRADE SERVICES)	Land transport and related services
4	Sphera Franchise Group	Assistance, consultancy, support services. Other service activities
5	TERAPLAST SA	Chemical and petrochemical industry and related service activities
6	SOCIETATEA ENERGETICA ELECTRICA S.A.	Energy, oil and gas and energy mining
7	S.N.T.G.N. TRANSGAZ S.A.	Energy, oil and gas and energy mining
8	S.N.G.N. ROMGAZ S.A	Energy, oil and gas and energy mining
9	S.N. NUCLEARELECTRICA S.A.	Energy, oil and gas and energy mining
10	PURCARI WINERIES PUBLIC COMPANY LIMITED	Food, beverage and tobacco industry
11	ONE UNITED PROPERTIES	Financial, banking and insurance activities
12	OMV PETROM S.A.	Energy, oil and gas and energy mining
13	MedLife S.A.	Health care. Health and veterinary activities
14	FONDUL PROPRIETATEA	Financial, banking and insurance activities
15	Digi Communications N.V.	Information technology and telecommunications
16	CONPET SA	Energy, oil and gas and energy mining
17	C.N.T.E.E. TRANSELECTRICA	Energy, oil and gas and energy mining
18	BURSA DE VALORI BUCURESTI SA	Financial, banking and insurance activities
19	BRD - GROUPE SOCIETE GENERALE S.A.	Financial, banking and insurance activities
20	AQUILA PART PROD COM	Trade
21	AEROSTAR S.A.	Manufacture of machinery and metal products
22	ANTIBIOTICE S.A.	Manufacture of chemicals and petrochemical products and related activities

No.	Company name	Sector of activity
23	ALUMIL ROM INDUSTRY S.A.	Trade
24	BIOFARM S.A.	Chemical and petrochemical industry and related activities
25	BITTNET SYSTEMS SA BUCURESTI	Information technology and telecommunications
26	CEMACON SA	Manufacture of glass and fine ceramics. Manufacture of other non-metallic mineral products
27	SSIF BRK FINANCIAL GROUP SA	Financial, banking and insurance activities
28	TURBOMECHANICA S.A.	Manufacture of machinery and equipment and metal structures
29	CHIMCOMPLEX S.A. BORZESTI	Chemical and petrochemical industry and related activities
30	VRANCART SA	Logging and primary processing of wood. Manufacture of paper and paper products

Source: own processing

Also, based on the data collected on the sector of activity of the companies analysed, we structured them into 5 main categories:

- Industry: 10 companies (Alro SA, Teraplast SA, Purcari Wineries Public Company Limited, Aerostar SA, Antibiotice SA, Biofarm SA, Turbomecanica SA, Chimcomplex SA Borzesti, Vrancart SA, Cemacon SA);
- Energy, oil and gas: 7 companies (Societatea Energetica Electrica SA, S.N.T.G.N. Transgaz SA, S.N.G.N. Romgaz SA, S.N. Nuclearelectrica SA, OMV Petrom SA, Conpet SA, C.N.T.E.E. Transelectrica);
- Financial services: 6 companies (Banca Transilvania SA, One United Properties, Fondul Proprietatea, Bursa

de Valori București SA, BRD - Groupe Societe Generale SA, SSIF Brk Financial Group SA);

- Services: 5 companies (TTS – Transport Trade Services, Sphera Franchise Group, MedLife SA, Digi Communications NV, Bittnet Systems SA Bucharest);
- Trade: 2 companies (Aquila Part Prod Com, Alumil Rom Industry SA).

Data analysis and processing

The analysis of the information presented in the 2021 Annual Reports shows that all 30 sampled companies have an internal audit function, either organized in-house or outsourced (Table no. 2).

Table no. 2. How internal audit is organized

No.	Company name	Sector of activity	Does the company have an internal audit function within the company?	Internal audit is organized within a dedicated department?
1	ALRO S.A.	Metallurgical industry	YES	YES
2	BANCA TRANSILVANIA S.A.	Financial, banking and insurance activities	YES	YES
3	TTS (TRANSPORT TRADE SERVICES)	Land transport and related services	YES	YES
4	Sphera Franchise Group	Assistance, consultancy, support services. Other service activities	YES	NO
5	TERAPLAST SA	Chemical and petrochemical industry and related service activities	YES	YES
6	SOCIETATEA ENERGETICA ELECTRICA S.A.	Energy, oil and gas and energy mining	YES	YES
7	S.N.T.G.N. TRANSGAZ S.A.	Energy, oil and gas and energy mining	YES	YES
8	S.N.G.N. ROMGAZ S.A	Energy, oil and gas and energy mining	YES	YES

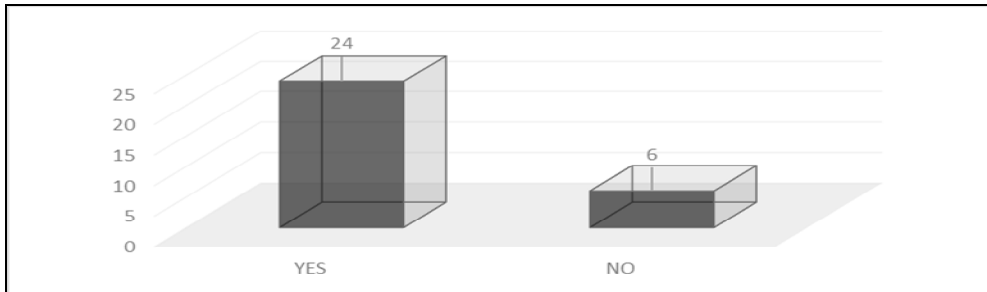
No.	Company name	Sector of activity	Does the company have an internal audit function within the company?	Internal audit is organized within a dedicated department?
9	S.N. NUCLEARELECTRICA S.A.	Energy, oil and gas and energy mining	YES	YES
10	PURCARI WINERIES PUBLIC COMPANY LIMITED	Food, beverage and tobacco industry	YES	YES
11	ONE UNITED PROPERTIES	Financial, banking and insurance activities	YES	YES
12	OMV PETROM S.A.	Energy, oil and gas and energy mining	YES	YES
13	MedLife S.A.	Health care. Health and veterinary activities	YES	YES
14	FONDUL PROPRIETATEA	Financial, banking and insurance activities	YES	YES
15	Digi Communications N.V.	Information technology and telecommunications	YES	YES
16	CONPET SA	Energy, oil and gas and energy mining	YES	YES
17	C.N.T.E.E. TRANSELECTRICA	Energy, oil and gas and energy mining	YES	YES
18	BURSA DE VALORI BUCURESTI SA	Financial, banking and insurance activities	YES	NO
19	BRD - GROUPE SOCIETE GENERALE S.A.	Financial, banking and insurance activities	YES	YES
20	AQUILA PART PROD COM	Trade	YES	YES
21	AEROSTAR S.A.	Manufacture of machinery and metal products	YES	YES
22	ANTIBIOTICE S.A.	Manufacture of chemicals and petrochemical products and related activities	YES	YES
23	ALUMIL ROM INDUSTRY S.A.	Trade	YES	NO
24	BIOFARM S.A.	Chemical and petrochemical industry and related activities	YES	YES
25	BITTNET SYSTEMS SA BUCURESTI	Information technology and telecommunications	YES	NO
26	CEMACON SA	Manufacture of glass and fine ceramics. Manufacture of other non-metallic mineral products	YES	NO
27	SSIF BRK FINANCIAL GROUP SA	Financial, banking and insurance activities	YES	NO
28	TURBOMECANICA S.A.	Manufacture of machinery and equipment and metal structures	YES	YES
29	CHIMCOMPLEX S.A. BORZESTI	Chemical and petrochemical industry and related activities	YES	YES
30	VRANCART SA	Logging and primary processing of wood. Manufacture of paper and paper products	YES	YES

Source: own processing

Thus, out of the total of 30 companies included in the sample, for 24 of them, i.e. 80% of the total, internal audit is organized within a specific internal audit department,

while 6 companies, representing 20% of the total, have outsourced their internal audit to other entities specialized in this field (*Figure no. 1*).

Figure no. 1. Existence of internal audit departments in companies



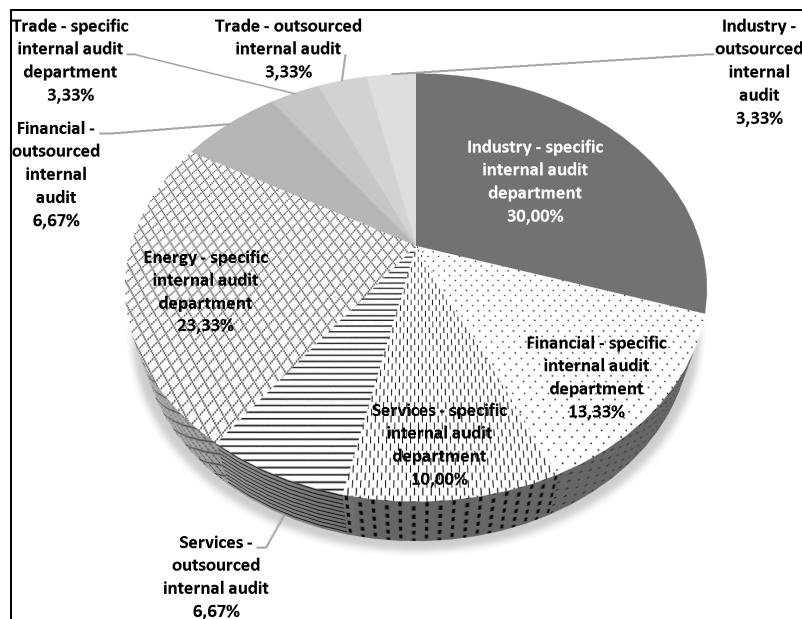
Source: own processing

In terms of sector typology, companies in industry have the highest degree of audit internalization, i.e. 30%, followed by companies operating in the energy sector, representing 23.33% of all companies analyzed. Financial entities with internal audit departments also have a share of 13.33%, with service companies at the bottom with 10.00% and trade companies with only 3.33%.

Of the companies that have outsourced their internal audit, 3.33% are in manufacturing, the same percentage is for companies in trade and 6.67% of companies are in the financial and services sector.

The breakdown by sector of activity and the form of internal audit adopted by companies is shown in *Figure no. 2*.

Figure no. 2. Breakdown by sector of activity and form of internal audit adopted by companies



Source: own processing

From the point of view of the actors benefiting from internal audit reports, in the case of companies where there is an internal audit department, the analysis carried out revealed that of the 24

companies, 12 report directly to the audit committee, 6 - to the board of directors, 4 - to the chief executive officer, and for 2 companies there are no reports (*Table no. 3*).

Table no. 3. Actors and reporting in internal audit in companies that have organized internal audit departments			
No.	Company name	Sector of activity	Actors to which they report
1	ALRO S.A.	Metallurgical industry	Board of Directors
2	BANCA TRANSILVANIA S.A.	Financial, banking and insurance activities	Audit Committee
3	TTS (TRANSPORT TRADE SERVICES)	Land transport and related services	Audit Committee
4	TERAPLAST SA	Chemical and petrochemical industry and related service activities	Board of Directors
5	SOCIETATEA ENERGETICA ELECTRICA S.A.	Energy, oil and gas and energy mining	Audit Committee
6	S.N.T.G.N. TRANSGAZ S.A.	Energy, oil and gas and energy mining	Audit Committee
7	S.N.G.N. ROMGAZ S.A	Energy, oil and gas and energy mining	Audit Committee
8	S.N. NUCLEARELECTRICA S.A.	Energy, oil and gas and energy mining	Board of Directors
9	PURCARI WINERIES PUBLIC COMPANY LIMITED	Food, beverage and tobacco industry	Audit Committee
10	ONE UNITED PROPERTIES	Financial, banking and insurance activities	Audit Committee
11	OMV PETROM S.A.	Energy, oil and gas and energy mining	Executive General Manager
12	MedLife S.A.	Health care. Health and veterinary activities	Audit Committee
13	FONDUL PROPRIETATEA	Financial, banking and insurance activities	Audit Committee
14	Digi Communications N.V.	Information technology and telecommunications	Audit Committee
15	CONPET SA	Energy, oil and gas and energy mining	Executive General Manager
16	C.N.T.E.E. TRANSELECTRICA	Energy, oil and gas and energy mining	Executive General Manager
17	BRD - GROUPE SOCIETE GENERALE S.A.	Financial, banking and insurance activities	Board of Directors
18	AQUILA PART PROD COM	Trade	Board of Directors
19	AEROSTAR S.A.	Manufacture of machinery and metal products	Board of Directors
20	ANTIBIOTICE S.A.	Manufacture of chemicals and petrochemical products and related activities	Audit Committee
21	BIOFARM S.A.	Chemical and petrochemical industry and related activities	Not specified
22	TURBOMECANICA S.A.	Manufacture of machinery and equipment and metal structures	Board of Directors
23	CHIMCOMPLEX S.A. BORZESTI	Chemical and petrochemical industry and related activities	Not specified
24	VRANCART SA	Logging and primary processing of wood. Manufacture of paper and paper products	Audit Committee

Source: own processing

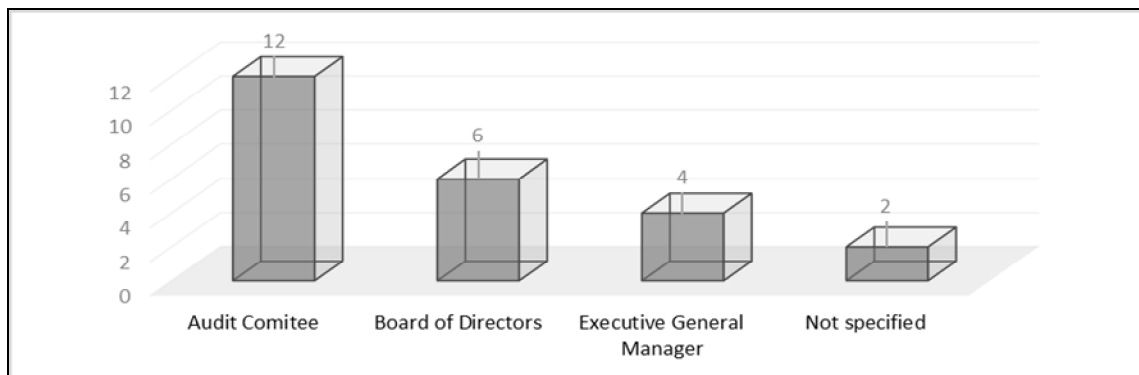
In terms of the internal audit – stakeholder reporting correlation (**Figure no. 3**), we concluded that in the manufacturing sector, 44.44% report to the board of directors, 33.33% report to the audit committee, and 22.23% report to the CEO.

In financial services, 75% of companies report to the audit committee and 25% report directly to the board of directors.

Companies in the energy, oil and gas sector report 42.86% to the audit committee, 42.86% to the chief executive officer and 14.28% to the board of directors.

In the case of service companies, reporting is only to the audit committee, while in commerce, the audit department reports directly to the board of directors.

Figure no. 3. Typology of actors and internal audit reporting



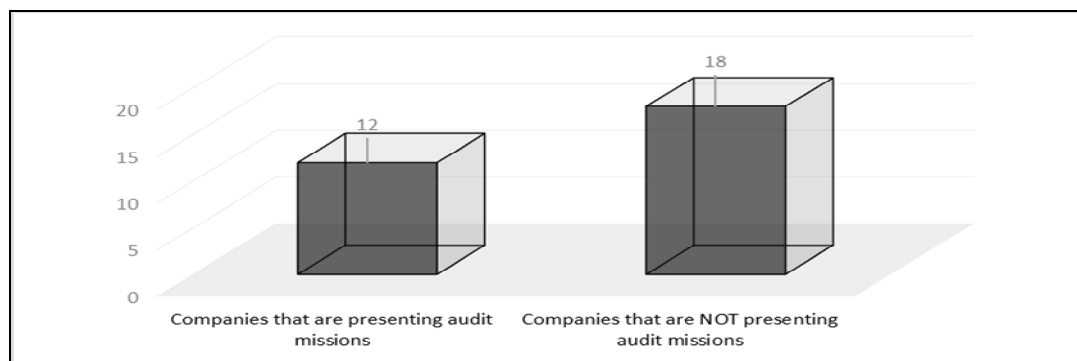
Source: own processing

The analysis showed that most of the companies analyzed meet the requirements of the BVB regarding the existence of internal audit departments, but also regarding the independence of its members and reporting. It is also noted that only 2 of the companies, namely Biofarm SA and Chimcomplex SA Borzești, both operating in the chemical and petrochemical industry sector, did not meet

these criteria, but it was mentioned that attempts are being made in the near future to correct this.

Another criterion for analyzing the companies was the information disseminated on the typology of the audit missions carried out. Thus, we noted that 12 companies out of 30 published in the 2021 annual report information on audit engagements carried out during that year (**Figure no. 4**).

Figure no. 4. Typology of audit assignments carried out within the company



Source: own processing

From the published information on internal audit engagements related to these companies, we have structured their typology into 8 broad categories as follows:

- Engagements related to the organization of the financial accounting department;
- Missions relating to compliance with and follow-up of internal procedures and regulations in force;
- Tasks relating to the purchase/sale of goods in/out of the company's assets;
- Tasks relating to the prevention of corruption;
- Tasks relating to the way management activities are carried out;
- Tasks relating to the adaptation of IT systems to the company's needs;

- Missions specific to the way the company's business is conducted;
- Other types of missions.

The study showed that the most frequent audit assignments are those relating to the organization of the financial-accounting department, compliance with internal procedures, and also those relating to the monitoring of the company's business processes (e.g. for a manufacturing company, how employees process raw materials, under what conditions, and whether they follow written procedures for this stage).

Given the importance of ERP systems in companies listed on the BVB and implicitly in internal audit missions, based on the reports published in 2021 we analyzed the existence of ERP systems in the sample of 30 companies chosen, in correlation with the internal audit organization formula (Table no. 4).

No.	Company name	Sector of activity	Information on the existence of an ERP system
1	ALRO S.A.	Metallurgical industry	No information
2	BANCA TRANSILVANIA S.A.	Financial, banking and insurance activities	No information
3	TTS (TRANSPORT TRADE SERVICES)	Land transport and related services	No information
4	Sphera Franchise Group	Assistance, consultancy, support services. Other service activities	YES
5	TERAPLAST SA	Chemical and petrochemical industry and related service activities	YES
6	SOCIETATEA ENERGETICA ELECTRICA S.A.	Energy, oil and gas and energy mining	YES
7	S.N.T.G.N. TRANSGAZ S.A.	Energy, oil and gas and energy mining	No information
8	S.N.G.N. ROMGAZ S.A.	Energy, oil and gas and energy mining	No information
9	S.N. NUCLEARELECTRICA S.A.	Energy, oil and gas and energy mining	No information
10	PURCARI WINERIES PUBLIC COMPANY LIMITED	Food, beverage and tobacco industry	No information
11	ONE UNITED PROPERTIES	Financial, banking and insurance activities	No information
12	OMV PETROM S.A.	Energy, oil and gas and energy mining	No information
13	MedLife S.A.	Health care. Health and veterinary activities	No information
14	FONDUL PROPRIETATEA	Financial, banking and insurance activities	No information
15	Digi Communications N.V.	Information technology and telecommunications	No information
16	CONPET SA	Energy, oil and gas and energy mining	YES
17	C.N.T.E.E. TRANSELECTRICA	Energy, oil and gas and energy mining	No information
18	BURSA DE VALORI BUCURESTI SA	Financial, banking and insurance activities	No information
19	BRD - GROUPE SOCIETE GENERALE S.A.	Financial, banking and insurance activities	No information
20	AQUILA PART PROD COM	Trade	YES

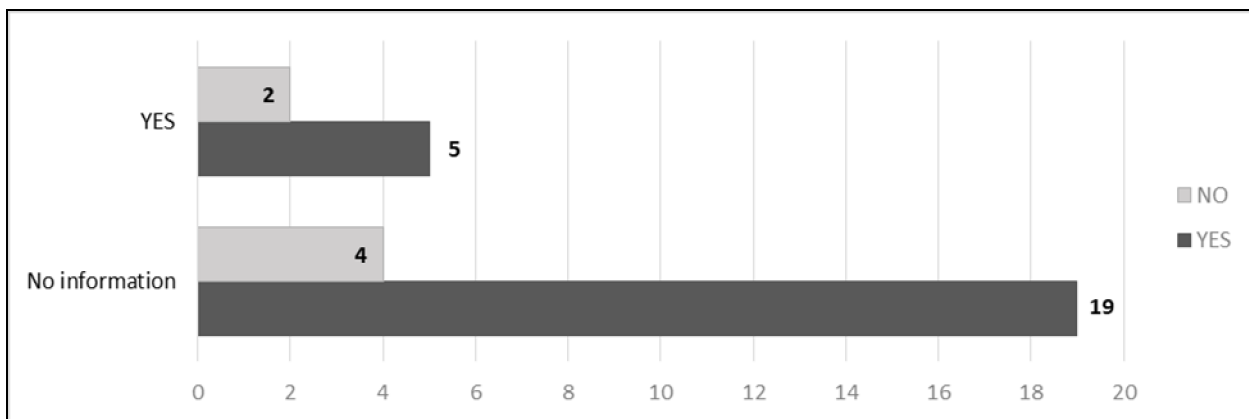
No.	Company name	Sector of activity	Information on the existence of an ERP system
21	AEROSTAR S.A.	Manufacture of machinery and metal products	No information
22	ANTIBIOTICE S.A.	Manufacture of chemicals and petrochemical products and related activities	No information
23	ALUMIL ROM INDUSTRY S.A.	Trade	No information
24	BIOFARM S.A.	Chemical and petrochemical industry and related activities	No information
25	BITTNET SYSTEMS SA BUCURESTI	Information technology and telecommunications	YES
26	CEMACON SA	Manufacture of glass and fine ceramics. Manufacture of other non-metallic mineral products	No information
27	SSIF BRK FINANCIAL GROUP SA	Financial, banking and insurance activities	No information
28	TURBOMECANICA S.A.	Manufacture of machinery and equipment and metal structures	YES
29	CHIMCOMPLEX S.A. BORZESTI	Chemical and petrochemical industry and related activities	No information
30	VRANCART SA	Logging and primary processing of wood. Manufacture of paper and paper products	No information

Source: own processing

Through the analysis we identified only 7 companies using ERP systems out of the total

of 30 analyzed, representing 23.33% (Figure no. 5).

Figure no. 5. Use of ERP systems in companies that have organized internal audit departments



Source: own processing

According to the survey, out of all the companies classified in the trade category, 50% report information on the existence of ERP systems and 50% do not report on this topic. In the energy sector, 28.57% provide information and 71.43% of those who do not provide details. Concerning those operating in

industry, 20% of them provide information on the ERP systems used, while 80% do not provide this detail. For services, the proportion of those presenting this requirement increases to 40%, while that for the category of those who do not provide the detail decreases to 60%. Of all the companies surveyed in

the financial sector, we did not find any company that does so.

Of the 24 companies that have a special internal audit department, we could find information on ERP IT systems for only 5 of them, i.e. 20.83%, the other 19, representing 79.17% of the total, did not specify this aspect in the Annual Report published for 2021.

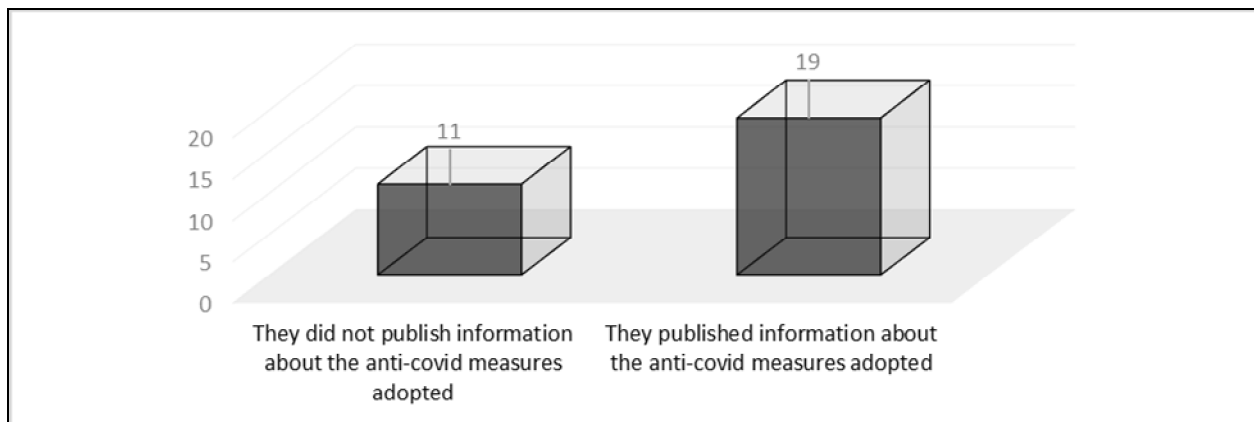
The remaining 6 companies that do not have a special internal audit department present the following information: 2 of them have implemented ERP systems and the other 4 do not present information.

The manner in which companies have responded with measures appropriate to the pandemic period was

another criterion for analysis. Although such information published in the Annual Report afferent 2021 does not explicitly address internal audit activity, it implicitly circumscribes internal audit activity, whether organized within the internal audit department or outsourced.

In this regard, in order to determine the effects of the coronavirus pandemic, we carried out an analysis on the sample of companies chosen, concluding the additional risks generated by the pandemic, the way in which they were managed internally, as well as the efficiency and the way in which compliance was verified by the company's employees (*Figure no. 6*).

Figure no. 6. Companies publishing information on anti-coverage measures taken



Source: own processing

Thus, out of the sample of 30 companies, 19 published information on the anti-coverage measures adopted, while 11 of them did not specify these details. Among the most common measures adopted we list:

- Deployment of remote working environment (adoption of "work from home" programme);
- Temperature monitoring at the entrance of the company;
- Setting strict rules for visitors or restricting their access;
- Limiting travel abroad;
- Establishing a team to keep the Covid-19 situation in the company up to date;
- Preventive measures and disinfection of workplaces;
- Additional protective measures for people in the at-risk category.

The analysis of the anti-covid measures adopted and their impact shows that the entities have focused on the principle of business continuity, adopting specific measures so as to increasingly reduce the risk of illness of employees, but also to allow the safe conduct of normal business.

Conclusions

The research carried out highlights the concern of the companies analyzed for effective corporate governance. Good governance mitigates risks and at the same time increases the performance of the entities that adopt it. In this respect, the results of the study revealed the existence of an internal audit formula, either by organizing specific internal audit departments within companies or by outsourcing it.

Regarding the organization of internal audit, the analysis carried out in this study found that most companies organize their internal audit activity within the company, creating a much closer relationship between the company's governance and internal auditors. In this way, internal processes in the company's specific business area can be analyzed much more closely and much more often so that associated risks can be detected much earlier.

In terms of reporting, we found that half of the companies report directly to the audit committee on the findings, and in the fewest cases there is direct reporting to the CEO. This is a normality as the 'filtering' of information through others (e.g. the audit committee) is very important. The predominance of reporting directly to the audit committee was noted to be prevalent in the areas of manufacturing, finance, energy, oil and gas and services. This trend could not be observed in the case of commerce, where we noted that reporting is entirely to the board of directors.

In terms of dissemination of information on the typology of internal audit engagements, the survey results revealed that only 40% of companies report such information.

Although ERP systems are important for the internal management of a company, out of the total analyzed, we

found that only 7 companies have implemented such systems, while 23 of them do not report. The sector with the highest degree of use of Enterprise Resource Planning systems is commerce.

Given the global pandemic context and the challenging year 2021 for both companies and users of their products (be they services or goods), we chose to include within the research an analysis of the anti-coverage measures adopted by the companies in the sample, in order to streamline both internal audit and the working environment within the company. The results revealed that 63% of the sampled companies mention these measures and 37% specify information about the impact of covid on financial statements.

As future research directions, we propose to continue the research with the expansion of the analysis criteria and the sample by company and business sector.

Regarding the limitations of the research, we consider that one of the limitations is the lack of information about some of the companies included in the sample. However, we consider that the preponderance of information published by these companies does not impact the results of the research.

REFERENCES

1. Anderson, U. (2003), Chapter 4. Assurance and Consulting Services, în „Research Opportunities in Internal Auditing”, *Altamonte Springs: The Institute of Internal Auditors Research Foundation*, pp. 98-129,
2. Boța-Avram C. și Popa, I. (2011), Evolution of Internal Auditing in Romania: A Critical Analysis, *International Journal of Disclosure and Governance*, Volume 8, No. 4, pp.380-398, DOI: 10.1057/jdg.2011.10
3. Camera Auditorilor Financiari din România (2013). Hotărârea Consiliului Camerei Auditorilor Financiari din România nr. 48/26 iunie 2014 pentru adoptarea Normelor obligatorii din Cadrul internațional de practici profesionale, emise de Institutul Global al Auditorilor Interni (IIA Global), ediția 2013;
4. Chersan, I.C. (2016), Internal audit practices and trends in Romania and worldwide, *Audit Financiar*, vol. XIV, no. 9(141)/2016, pp. 987-1002, DOI: 10.20869/AUDITF/2016/141/987;
5. COSO (1992). Committee of Sponsoring Organizations of the Treadway Commission, New York;
6. Ghiță, M. (2008), Guvernanța Corporativă, *Ed. Economică*, București;
7. Guan, P., Liangrong, S., Haimin, C. (2016). Study on Internet Investor Relations Management Evaluation of Listed Companies in China. *Accounting and Finance Research*, Vol. 5, No. 1, 121-129;
8. Guvernul României (2011) Hotărârea nr.1260 din 21 decembrie 2011 privind sectoarele de activitate stabilite conform Legii nr.62/2011, *Monitorul Oficial al României*, nr. 933, din 29 decembrie 2011;
9. Flemming Ruud, T. (2003), Chapter 3. The Internal Audit Function: An Integral Part of Organizational Governance, pp. 74-96, în „Research Opportunities in Internal Auditing”, *Altamonte Springs: -The Institute of Internal Auditors Research Foundation*;

10. Hațegan, C.-D., (2020), The Evaluation of the Communication of the Romanian Listed Companies with the Investors, *Audit Financiar*, vol. XVIII, no. 4(160)/2020, pp. 801-811, DOI: 10.20869/AUDITF/2020/160/027;
 11. Igna, R. D., Ionescu, B. Ș., (2021), Internal Audit in ERP Systems Context, *Audit Financiar*, vol. XIX, no. 3(163)/2021, pp. 544-554, DOI: 10.20869/AUDITF/2021/163/018;
 12. Moeller, R.R. și Witt, H.N. (1999), Brink's Modern Internal Auditing, 5th Edition, New York: *John Wiley & Sons, Inc.*;
 13. Nazemi, E., Jafar-Tarokh, M., Djavanshir, R. G. (2012), ERP: a literature survey, *International Journal of Advanced Manufacturing Technology*, vol. 61, 999-1018;
 14. Ștefănescu, A., Țurlea, E. (2013) Comitetul de audit intern – o abordare multidimensională în contextul național, *Audit Financiar* nr. 7/2013, pp. 15-24;
 15. Parlamentul României (2011), Legea nr. 162/2017 privind auditul statutar al situațiilor financiare anuale și al situațiilor financiare anuale consolidate și de modificare a unor acte normative, *Monitorul Oficial al României*, Partea I, nr. 548, din 12.07.2017;
 16. Rattliff, R.L., Reding, O.F. (2002), Introduction to Auditing: Logic, Principles, and Techniques, *Altamonte Springs: The Institute of Internal Auditors Research Foundation*;
 17. Timofte, V. (2020), Momente definitorii în apariția și evoluția auditului intern în țara noastră, *Buletinul Universității Naționale de Apărare „Carol I”*, 10.12753/2065-8281-20-72
- Reports**
18. AEROSTAR S.A., (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/ARS_20220421071809_Raport-anual-2021.pdf> [Accessed 04.12.2022]
 19. ALRO S.A., (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/ALR_20220428192453_Grupul-ALRO-Raport-anual-2021.pdf> [Accessed 04.12.2022]
 20. ALUMIL ROM INDUSTRY S.A., (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/ALU_20220427162149_Alumil-Rom-Situatii-financiare-la-31-12-2021.pdf> [Accessed 04.12.2022]
 21. ANTIBIOTICE S.A., (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/ATB_20220427164046_Raport-anual-2021.pdf> [Accessed 04.12.2022]
 22. AQUILA PART PROD COM, (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/AQ_20220429141339_Raport-Anual-Situatii-Financiare-2021.pdf> [Accessed 04.12.2022]
 23. BANCA TRANSILVANIA S.A., (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/TLV_20220429070601_Raport-anual-2021-rom.pdf> [Accessed 04.12.2022]
 24. BIOFARM S.A., (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/BIO_20220428170028_Raport-anual-2021.pdf> [Accessed 04.12.2022]
 25. BITTNET SYSTEMS SA BUCURESTI, (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/BNET_20220421184412_Raport-Anual-2021.pdf> [Accessed 04.12.2022]
 26. BRD - GROUPE SOCIETE GENERALE S.A., (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/BRD_20220428170959_BRD-Raport-anual-2021-RO.pdf> [Accessed 04.12.2022]
 27. BURSA DE VALORI BUCURESTI SA, (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/BVB_20220428162909_Raport-anual-2021.pdf> [Accessed 04.12.2022]
 28. CEMACON SA, (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/CEON_20220429120839_Raport-anual-2021.pdf> [Accessed 04.12.2022]
 29. CHIMCOMPLEX S.A. BORZESTI, (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/CRC_20220429150930_Raport-anual-2021.pdf> [Accessed 04.12.2022]
 30. C.N.T.E.E. TRANSELECTRICA, (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/TEL_20220428140139_01-Raportare-anuala-2021-RO-compressed.pdf> [Accessed 04.12.2022]

31. CONPET SA, (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/COTE_20220429072611_COTE-29-04-2022---Raport-anual-2021-BVB-RO.pdf> [Accessed 04.12.2022]
32. Digi Communications N.V., (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/DIGI_20221128175614_Raport-anual-Digi-Communications-N-V-31-Decembrie-2021.pdf> [Accessed 04.12.2022]
33. FONDUL PROPRIETATEA, (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/FP_20220421153451_2021---Raport-anual.pdf> [Accessed 04.12.2022]
34. MedLife S.A., (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/M_20220429030421_Raport-Anual-2021-EN-full-pack-compressed.pdf> [Accessed 04.12.2022]
35. OMV PETROM S.A., (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/SNP_20220427214045_Rapoarte-anuale-situatii-financiare-si-plati-catre-guverne.pdf> [Accessed 04.12.2022]
36. ONE UNITED PROPERTIES, (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/ONE_20220426191404_RO-ONE-2021-Raport-anual-VF.pdf> [Accessed 04.12.2022]
37. PURCARI WINERIES PUBLIC COMPANY LIMITED, (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/WINE_20220429180945_Purcari-Wineries-PLC-Raport-Anual-2021.pdf> [Accessed 04.12.2022]
38. Sphera Franchise Group, (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/SFG_20220428162749_SFG-Annual-Report-Conso-FS-Separate-FS-RO.pdf> [Accessed 04.12.2022]
39. S.N.T.G.N. TRANSGAZ S.A., (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/TGN_20220428114206_Raport-anual-2021.pdf> [Accessed 04.12.2022]
40. S.N.G.N. ROMGAZ S.A, (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/SNG_20220428215142_Raportul-anual-2021.pdf> [Accessed 04.12.2022]
41. S.N. NUCLEARELECTRICA S.A., (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/SNN_20220428163959_Raport-anual-2021-integrat-RO.pdf> [Accessed 04.12.2022]
42. SOCIETATEA ENERGETICA ELECTRICA S.A., (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/EL_20220421160903_ELSA-RO-Raport-Anual-2021-Electrica-compressed.pdf> [Accessed 04.12.2022]
43. SSIF BRK FINANCIAL GROUP SA, (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/BRK_20220427182734_RAPORT-RO.pdf> [Accessed 04.12.2022]
44. TTS (TRANSPORT TRADE SERVICES), (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/TTS_20220429190043_Raport-anual-2021---RO.pdf> [Accessed 04.12.2022]
45. TERAPLAST SA, (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/TRP_20220428202809_Raport-Anual-2021-Grup-TeraPlast-compressed.pdf> [Accessed 04.12.2022]
46. TURBOMECANICA S.A., (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/TBM_20220429132031_Raport-Anual-RO-2021-inclusiv-Raport-Auditor.pdf> [Accessed 04.12.2022]
47. VRANCART SA, (2021). Raport Anual 2021. [online] Available at: <https://bvb.ro/infocont/infocont22/VNC_20220427165054_VRANCART---Raport-anual-2021.pdf> [Accessed 04.12.2022]

The Sustainable Relationship between Investments in Human Capital and M&A

Scientific researcher *Irina CHIRIAC, Ph. D.*,
Institute of Interdisciplinary Research, Department of
Social Sciences and Humanities, "Alexandru Ioan Cuza"
University of Iasi, Romania, e-mail: chiriac.irina@uaic.ro

Abstract

The purpose of this study is to investigate the sustainable relationship between government investment in human capital and the number of mergers and acquisitions (M&A). The analysis is carried out on EU countries grouped into emerging countries, frontier countries and developed countries, considering the FTSE Russell ranking. Specifically, the research looks at the impact of a range of social factors: government expenditure on recreation programmes, community events, festivals (RCR), expenditure on housing and community facilities (HCA), expenditure on schools and universities (EDUC), expenditure on hospitals and general practitioners (HLT), expenditure on social protection (SP) and public order and safety (POS), defence expenditure (DEF) and environmental protection expenditure (EP) on the volume of merger or acquisition operations. Following the study carried out with the help of the panel data methodology and the OLS (ordinary least squares) method, we concluded that a business environment characterized by sustainable government investments in culture and education is more likely to contribute to business success and to attract more foreign investors, including those resorting to mergers or acquisitions. The results of the study could help identify the group of countries that require more attention from governments in terms of spending allocated from GDP for a sustainable human capital environment. Also, entrepreneurs can discover sustainable countries where they can make foreign direct investments with a favourable impact on the performance of the target companies.

Key words: M&A; human capital expenditures; sustainable relationship; social factors; investors behaviour; COFOG indicators;

JEL Classification: G34, M14, M21

To cite this article:

Chiriac, I. (2023), The Sustainable Relationship between Investments in Human Capital and M&A, *Audit Financiar*, vol. XXI, no. 2(170)/2023, pp. 355-368, DOI: 10.20869/AUDITF/2023/170/014

To link this article:

<http://dx.doi.org/10.20869/AUDITF/2023/170/014>

Received: 31.03.2023

Revised: 7.04.2023

Accepted: 12.05.2023

Introduction

Cross-border mergers are an important way for a state to grow economically (Wang and Wong, 2009; Doytch and Cakan, 2011; Hsueh et. al. 2014; Akalpler and Adil, 2017), but due to the lack of knowledge of managers, many mergers go bankrupt shortly after the operation.

The analysis of the specialized literature shows us that among the causes of the failure of the reorganization operations is the improper economic order (Gunther, 2001; Schraeder and Self, 2003; Houwers, 2016; Renneboog and Vansteenkiste, 2019). Studies that have analysed the causes of the failure of many M&A operations have identified cultural differences between countries as a possible cause.

The article is based on the theory of organizational behaviour since the early 1980s, a theory that discusses in several books (Deal and Kennedy, 1982; Peters and Waterman, 1982; Cartwright and Cooper, 2006) about the connection between employee culture and company performance.

We can thus deduce two types of merger-marriage: "collaborative marriages" in which the merging partners take the best of each other's cultures, creating a "best of both worlds" culture, thus creating a win-win scenario and unfortunately the worst and most common scenario, where the dominant company tries to change the culture of the employees of the absorbed company, thus creating a win/loss situation.

Thus, merger or acquisition reorganization transactions are doomed to failure because one of the merging partners does not accept or tolerate the other company's employees' perception of the terms of the merger-marriage. The greater the degree of difference in cultures, the harder it is to bond the two societies, and the longer this reorganization process will take.

The literature states that the merger and acquisition transactions did not meet expectations. In many cases, the problem of integration is the problem of human capital, which makes it the second most important direct factor (Grunther, 2001; McCarthy, 2011; Godfred, 2016; Groen and Houwers, 2016).

Continuing to study the literature, we try to answer the question: why do some M&As work and others don't?

According to Hoetzel (2005), the failures of reorganization operations were frequently encountered in two phases: pre-acquisition and post-acquisition and were determined

by the national cultural differences of the employees of the two companies involved in the process.

National cultural differences make their mark on the organizational culture and negatively affect the performance of the absorbing firm (Gunkel et. al. 2015; Godfred, 2016; Alexandridis et.al. 2022; Farooq et. al. 2022). Mergers and acquisitions are dynamic, multi-faceted processes that incorporate different forms of success and failure, and the integration of an HR manager is key to an optimal outcome of the transaction (Moore, 2021).

There is a negative link between national cultural distance and share turnover and M&A success (Chand et.al., 2021).

Investigating the role of cultural factors (national language, religion, political distance) on M&A it was found that a one percent standard deviation increases in language distance leads to a decrease in the number of mergers by 25% while political distance has no significant effect (Langosch and Tumlinson, 2020).

As far as we know, so far, no comparative studies have been conducted in emerging countries, frontier and developed countries, but only microeconomic studies have been conducted.

In studies conducted on economic societies in various industries, the most common factor in mergers and acquisitions failures is organizational and national culture.

In studies conducted on economic societies in various industries, the most common factor in mergers and acquisitions failures is human capital national environment.

Given the fact that a large volume of mergers and acquisitions do not achieve planned results and synergies and that M&A success is affected by different factors such as, strategy, corporate culture, managerial control, business environment, company size etc., the main aim of this paper is to analyse the impact of sustainable governmental culture expenditures on the success of the absorber company.

Starting from the model proposed by Bouwman (2013), we used panel data on 243 observations that took place between 2012 and 2020.

This paper considers the Classification of the Functions of Government COFOG key indicators, which measures since 1999 the Government expenditure on culture.

The COFOG system comprises government investment of GDP in nine categories namely: education, health, social protection, public order and safety, defence, housing and community facilities, environmental protection, economic affairs, and recreation and cultural and religious services.

Until now, the effects of these indicators on the evolution of mergers and acquisitions have not been analysed, most of the studies already published being focused on foreign direct investments, which include greenfield investments in addition to mergers or acquisitions.

The paper is organised as follows: Section 2 reports the reasons for the failure of mergers and acquisitions found in the literature; Section 3 describes the sample, data and methodology used in the research; Section 4 reports the results obtained as well as the discussions on their account. Finally, the research concludes with concluding remarks and conclusions.

1. Theoretical background

Mergers and acquisitions are a complex phenomenon but also extremely challenging because they exemplify an interesting paradox.

On the one hand, there is an increase in the activity and volume of mergers because these operations have many advantages for companies, while on the other hand, mergers and acquisitions have a high failure rate.

The issue of merger operations and activity has concerned many researchers from both the academic and business environments, being analyzed by financial and strategic aspects, behavioural and intercultural aspects, the synergies associated with these reorganization operations. (Birkinshaw et al., 2000; Cartwright and Schoenberg, 2006; Cai et al., 2016).

Part of the literature states that about forty to sixty percent of mergers and acquisitions fail to achieve the expected outcome (Uzelac et al., 2015). While another part of the literature even presents a higher M&A failure rate about sixty to eighty percent (Angwin, 2007; Johnson, 2007; Hitt et al., 2009; Groen and McCarthy, 2011).

Although there is a lot of research on mergers and acquisitions, there is no consensus on the reasons for the failure.

The failure of the mergers and acquisitions is largely due to total lack of communication with key personnel of the companies involved in the merger process (Walter, 2020; Castellacci et al., 2022).

Other authors (Lynch and Lind, 2002; Gadiesh and Ormiston, 2002; Steigenberger, 2016) found five important causes of the failure of the merger and acquisition, namely: poor strategy; different cultures; communication difficulties between the organization's management and employees; poor planning and execution of the integration process; purchase price too high for the target company.

Mergers and acquisitions often fail because of the personal motives of investors, they often invest in a company to seek glory and satisfy their "executive ego". Foreign investors are thus losing sight of the fact that they must worry about the strategy for implementing the merger operations (Depamphilis, 2015).

Selecting a candidate absorbing company may be more of an art than a science (Lubatkin, 1983).

Ritesh (2018) explains in his study that corporate governance influences the post-acquisition performance, Lin et al. (2020) argue that M&As failure is caused by conservatism and lamandi and Munteanu (2014) found the cause of economic environment education level responsible for the failure of the reorganization procedures.

In other studies, different perceptions of how the country deals with social and cultural issues may influence the investor in such a way that a foreign investor's decision may be made solely on the basis of these factors (Frensch, 2007; Vaara, 2012; Ciobanu and Bahna, 2015; Teti, 2022).

A company should carefully consider all components of the sustainable regulatory framework of the country in which it wishes to operate (institutional infrastructure, foreign trade policy, government position on R&D, health and education, employee code of conduct) so that it can operate and develop normally (Mladen et al. 2020).

Phuong's (2021) research highlights the strong implications of environment government policies on FDI in various sectors of the economy.

The European Court of Auditors, based on the Eurostat document entitled General government expenditure by function (COFOG), measures public administration expenditure broken down by function.

Not many studies have examined the evolution of FDI using disaggregated data of public expenditure categories (COFOG) and most of them studied the linkage across globe or in a certain country not in Europe and not on type of economy, as we intended to do in this study. However,

it must be considered that foreign direct investments are also a tool for the practice of round tripping of capital (Afrasinei, 2015; Afrasinei, 2019; Aykut et. al., 2017; Ledyeva et al., 2015)

Some authors (Dreher and Gason, 2008) in their research found no significant correlation between FDI and cultural factors, while a researcher (Saahdong, 2010), on the sample of four countries (Denmark, Sweden, Norway, and Finland) discovered a positive effect between FDI and COFOG indicators. A study of OECD countries concluded that year-on-year increases in the indicator measuring trade and financial openness over the past three decades have led to reductions in public spending (Garrett and Mitchell, 2001).

The reason is that foreign investors have borne the expenses of employees in terms of education or health care. Poor efficiency of public investment can cause serious damage to the economy, such as the low investment trap (Bayraktar, 2019).

Kittel and Winner (2005) and Plumber et. al. (2005) performed the same studies, with the same data and rejected the authors' result above, they reach neutral results.

Public spending on education, training, research and development and infra-structure encourages international capital mobility in regions with better opportunities (Tanzi, 2002; Gemmel et. al., 2007; Meglio, 2020).

Figlio and Blonigen (2000) found that communities with more foreign investment are characterized by public spending on transportation and public safety.

Uncertainty of regulatory may diminish corporate investment. According to some authors, there is a significant link between pollution and foreign investment (Keller and Levinson, 2002; Zahoor et. al., 2021).

Apart from the multitude of indicators that measure the performance of the company, investors must evaluate the development capacity of companies in the long term (Carp et. al., 2020).

As a general conclusion of the literature, the factor that is seen by most as the most ubiquitous reason for failure in cross-border M&As is: culture issue.

GDP is considered a standard macroeconomic indicator that characterizes a country's national wealth. There is a statistically significant positive link between the evolution of mergers and acquisitions and GDP (Erel et. al., 2012; Boateng et. al., 2014; Deng and Yang, 2014).

Thus, in our study, government investment in human capital will be considered as independent variables and GDP growth rate will be considered as control variable.

2. Sample, data and methodology

The purpose of this study is to analyse the impact of sustainable governmental expenditures on the success of reorganization operation by merger or acquisition. More precisely we want to establish a link between government expenditures in human capital on the number of mergers and acquisitions. To achieve this purpose, 27 European countries, grouped according to FTSE Russell criteria in emerging nations (EM), developed nations (D), and frontier nations (F).

From the group of developed nations, we analysed the following: Austria, Poland, Finland, Germany, Denmark, France, Belgium, Luxembourg, Italy, Ireland, Spain, Netherlands, Sweden and Portugal; as frontier nations we included Bulgaria, Romania, Croatia, Cyprus, Estonia, Latvia, Lithuania, Slovakia, Malta and Slovenia and in the emerging countries are Greece, Hungary and Czech Republic.

The research is based on data collected from the Institute of Mergers, Acquisitions and Alliances (IMAA 2022) and the European Statistical Institute Eurostat (2022), over a period of nine years (2012-2020). The sample includes 243 observations.

The main hypothesis underlying our study are:

H1: Entrepreneurs are attracted by countries that offers them economic support for a business.

H2: A better rated sustainable environment that is characterized by investments in human capital is more likely to attract more foreign direct investment.

Starting from the model proposed by Bouwman Christa (2013), and ESA (2010) for testing the hypothesis, we used panel data regression models, which were run with the help of the Eviews program. Thus, the equation of the regression model used for the empirical investigation is:

$$M\&A_{it} = \beta_1 SUST_{it} + \beta_2 Z_{it} + \mu_{it} \quad (1)$$

where: I represent the country of absorbing company and t is time (2012 -2020); $M\&A_{it}$ represents the dependent variable which is expressing the number of mergers and acquisitions; $SUST_{it}$ represents the indicators measuring sustainable government expenditures on human capital;

Zit: represents the control variables; β_1 and β_2 are the coefficients; and μ_{it} represents the error term.

To perform the regression analysis, we tested the models with fixed effects, random effects and OLS adapted to

panel data. The results of the tests showed that the OLS model fits best to our data.

The variables used for our model are presented in **Table no. 1.**

Table no. 1. Description of variables used in the analysis	
Indicators (Abbreviation)	Definition
M&A	
Mergers and acquisitions (M&A)	Is the number of cross-borders mergers and acquisitions performed at the level of each country included in the analysis
Sustainable investments	
Recreation, culture and religion (RCR)	provide the means to build social capital, public expenditure on programmes of recreational activities, events, festivals, parades, and leisure. Is calculated as percentage of gross domestic product (GDP).
Education (EDUC)	includes government expenditure to support schools, universities, and other public educational institutions. Is calculated as percentage of gross domestic product (GDP).
Health (HLT)	government investment in hospitals and general practitioners, curative care services, rehabilitation services, clinical laboratories, patient transport services, prescription medication, etc. Is calculated as percentage of gross domestic product (GDP).
Social protection (SP)	disbursements for in sickness and disability, old age, survivors of war, support for families with children earning below the minimum wage, unemployment benefits, housing maintenance allowances for low-income families, etc. is calculated as percentage of gross domestic product (GDP).
Public order and safety (POS)	expenditures in police force, fire service, law courts and prison service. Is calculated as percentage of gross domestic product (GDP).
Defence (DEF)	government spends on military measures or resources. Is calculated as percentage of gross domestic product (GDP).
Environmental protection (EP)	government economic resources to improve air quality and prevent, reduce and eliminate pollution and other environmental degradation. Is calculated as percentage of gross domestic product (GDP).
Housing and community amenities (HCA)	disbursements for urban development (construction of housing for people with special needs, purchase of land or housing, ensuring the connection of housing to the public water network and public lighting, etc.). is calculated as percentage of gross domestic product (GDP).
Macroeconomic variables	
Real GDP growth rate (GDP%)	measures the growth of one time against another and is adjusted for inflation or deflation.

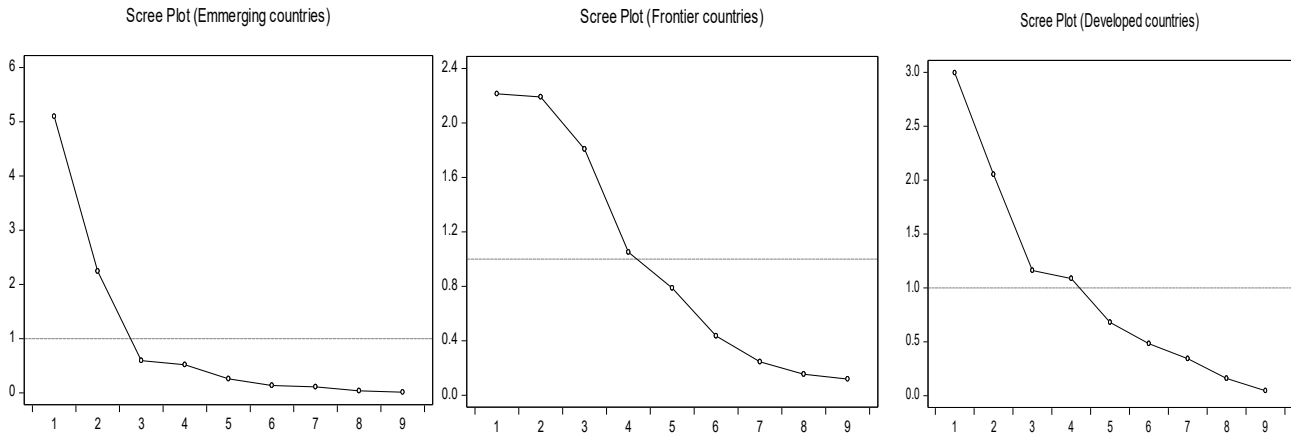
Source: the definitions of the variables are taken from the Eurostat database

3. RESULTS AND DISCUSSIONS

The **Figure no. 1** shows that at the level of group of emerging countries there exist five factors that together

can explain the variability in the original 9 variables. Also, at the level of frontier and developed countries there exists three factors that may explain the variability of the model.

Figure no. 1. Scree plot for the group of emerging, frontier and developed EU-countries

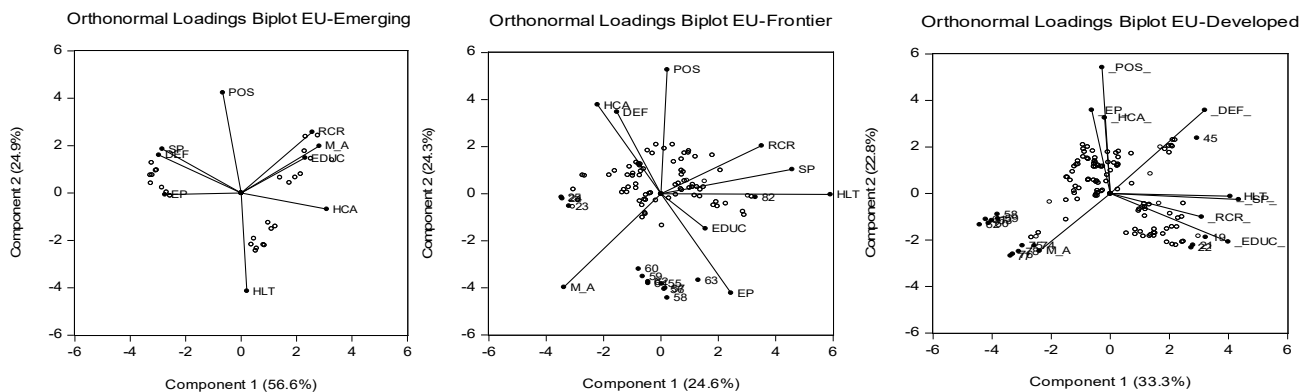


Source: Own processing

Orthonormal Loadings Biplot reveal that between M&As and GDP allocations in recreation, cultural and religion events, in schools and universities, housing

and community facilities and in environment protection there is a strong relation, as we can see in *Figure no. 2.*

Figure no. 2. Orthonormal Loadings Biplot for the group of emerging, frontier and developed EU-countries



Source: Own processing

In **Table no. 2** we can see the outcomes of the descriptive statistics. The variable measuring M&As varies significantly across different types of countries, as we imagined.

Indicators that measure the level of culture of a country are extremely important for entrepreneurs because, it is a proxy for whether a country invests in education and the higher the rate the more investors can hire trained new employees.

Most investments in social capital, recreational programs, community events, festivals and parades have been made in Belgium in 2017 and the fewest in Bulgaria in 2012.

Government expenditure of GDP in schools, universities and other public and private educational institutions varies between a minimum of 2.8 percent in Romania in 2013 and a maximum of 7.2 percent in Sweden in 2020.

More expenditures in hospitals, curative and rehabilitative medical services, patient transport, clinical laboratory tests, prescription drugs, etc. have been made in Austria in 2020 and the fewest in Cyprus.

Bulgaria, Cyprus, and Latvia invested the most in public order and safety and in defense throughout the analyzed period.

Government expenditures devoted to improving the quality of the air breathed, preventing, eliminating, or reducing

pollution and any other form of ambient deterioration varies between 1.8 percent in Belgium in 2012 and 0.2 percent in Cyprus in 2013.

The indicator that characterizes government expenditures in housing and community amenities varies a lot. Most government spending on housing and community facilities has been made in Croatia and least in Greece.

The control variable measuring the business environment also varied significantly across nations, as we anticipated.

Table no. 2. Descriptive statistics of the variables

Variable	Mean	Max.	Min.	Std. Dev.	Obs.
M&A	500.256	9052.300	11.700	14.135	243
RCR	1.299	4.600	0.500	0.508	243
EDUC	5.000	7.200	2.800	0.945	243
HLT	6.223	9.200	2.500	1.479	243
SP	16.869	27.300	8.800	4.185	243
POS	1.754	2.800	0.900	0.430	243
DEF	1.177	2.700	0.200	0.513	243
EP	0.766	1.800	0.200	0.346	243
HCA	0.694	2.400	0.200	0.478	243
GDP	1.595	25.200	10.800	3.700	243

Source: Own processing

Table no. 3 is comparing the averages for all considered variables in the analysed country groups.

The highest number of mergers and acquisitions was in the group of developed countries with 654 and the lowest number of 106 in the group of emerging

European countries. This is because the EU - Developed countries have a better-rated business environment, with concern for culture also a favourable business environment (fiscal stability, favourable regulatory affairs).

Table no. 3. Comparison of means of variables, by country category

Variable	EU-Emerging	EU-Developed	EU-Frontier
M&A	106.781	654.370	402.537
RCR	1.685	1.219	1.294
EDUC	4.548	5.162	4.910
HLT	6.088	6.968	5.220
SP	16.029	19.481	13.465
POS	2.003	1.553	1.961
DEF	1.348	1.048	1.306
EP	1.066	0.732	0.723
HCA	0.588	0.510	0.984
GDP	0.777	1.269	2.296

Source: Own processing

Table no. 4 assesses which variables, expressing the cultural dimension of a country, influence the number of M&A transactions. There are high correlation coefficients between the variables, and, for accuracy of the results, we ran two regression models.

The total spending on recreation, culture, and religion as a percentage from GDP has a very strong contribution in the mergers and acquisitions decision. This factor has a high impact on the investment process. The more the government invests in cinema, television, theatre, music halls, fairground attractions, circuses, corridas, amusement parks, dances, festivals, the more entrepreneurs want to make more mergers. Recreation and tourism associated with outdoor environments can play a huge role in local economies. The highest values of the coefficient registered in the group of EU-Developed countries (96).

The variable Education is a factor that positively influences the number of mergers in all three categories analysed. The more the government invests in schools and universities, the more mergers and acquisitions are attracted. This is because investors are attracted to smart and well-trained employees. The highest values of the coefficient registered in the group of EU-Developed countries (48).

There is a significant link between environmental protection and M&As. Spending time in green environments, especially participating in physical activity while in these environments, can lead to better overall health and wellness by reducing stress and blood pressure for employees.

Between independent variables public order and safety and defence and dependent variable M&As there is a significant link. Mergers are not attracted to countries where there are large investments in defence and armaments, because investors do not want to invest in countries likely to be involved in conflicts.

Investors are not very interested in investing in the public health system, at the level of developed countries the coefficient is only 17 percent, because the investors probably provide in the salary package of employees, private insurance facilities.

Disbursements for urbanization like construction of housing for the public or persons with special needs, acquisition of land necessary for the construction of houses, community development, water supply or public lighting influences significantly the investors decision.

The values obtained for the adjusted R square show the overall explanatory power of the variables included in the model.

Table no. 4. Regression analysis

Dependent Variable	EU-Emerging		EU-Developed		EU-Frontier	
	M&A (1)	M&A (2)	M&A (1)	M&A (2)	M&A (1)	M&A (2)
GDP	3.001 (4.008)	4.003* (2.008)	7.910*** (2.820)	6.809 (4.001)	7.528 (1.638)	7.005** (2.005)
RCR	75.057*** (2.350)	73.1002* (1.681)	9.120 (2.107)	96.660*** (1.970)	82.431*** (1.636)	87.110 (0.850)
EDUC	13.492 (1.892)	37.875** (0.920)	40.623*** (1.306)	48.943*** (1.207)	31.439*** (7.493)	42.520** (6.912)
HLT	2.924 (1.354)	15.429* (2.131)	17.212*** (1.052)	16.315 (1.761)	54.490 (6.303)	62.003** (5.490)
SP	25.716** (1.005)	24.329 (4.108)	33.148*** (4.308)	32.176* (3.203)	46.666 (3.504)	51.497** (3.207)
POS	39.191 (5.092)	42.731** (4.005)	27.964*** (3.613)	26.892* (3.512)	68.060*** (1.675)	67.124* (0.690)
DEF	41.947** (1.890)	40.602 (1.780)	21.113*** (3.436)	20.840 (3.200)	23.136 (1.217)	22.978* (1.459)
EP	57.903** (2.764)	54.180* (2.690)	86.365*** (3.131)	83.500 (3.200)	35.420*** (2.317)	33.168 (2.004)
HCA	26.209*** (5.305)	20.850 (4.700)	81.513** (4.179)	80.003* (2.008)	44.826*** (8.907)	41.007 (7.706)
Obs.	27	27	126	126	90	90
R-squared	0.971	0.938	0.813	0.800	0.687	0.645
R-squared adjusted	0.956	0.903	0.799	0.782	0.652	0.599
F-statistic	64.298***	63.824**	56.230***	54.190**	19.584***	20.190***

Source: Own processing

Given that the most M&As were made on the EU-Developed countries, with several 654 transactions and considering the culture coefficients of the analysed model (RCR 96,66; EP 86,36; HCA 81,51), the hypothesis that is validated is **H2: A better rated business environment that is characterized by investments in culture, is more likely to attract more foreign direct investment.**

Investors do not want to move their capital only in developed countries but also in countries where there are investments in recreational activities, theatre, festivals, in countries where they invest in the education system. For example, investors were attracted to Hungary which is an emerging country, but it has higher spendings on recreation, culture and religion as a percentage from GDP than the average of the group of developed countries (2.72 percent in contrast to the 1.22 percent). The same can be seen in Estonia, with an average of 2.03 percent spendings in RCR and 5.97 percent in schools and universities.

Examples of policy measures for to development of the culture, recreation and entertainment and education segment can be seen in Hungary:

- To ensure educational success, since September 2015 kindergarten is mandatory for children over 3 years.
- Through the Oktatási Hivatal program, the teachers and Higher Educations Institutions are evaluated and may receive accreditation.

- From January 2019, teachers are entitled to additional payment if they work with disadvantaged students, for example, Roma children.
- The introduction of the School Education Bridge program (Köznevelési Hidprogram), which helps those who leave early school to return to education. The program aims to introduce adults to vocational training that meets the current needs of the labour market.
- Introduction of the orientation classes. The aim of these preparation classes is recommended for those students who obtained the primary education certificate and do not know which type of secondary school or profession they should choose. students will find the profession/job they would like to do.
- Building professional festival alliances, like CIOFF Hungary, (music festivals), Magyarországi Gasztronómiai Fesztiválok Szövetsége (gastronomy festivals), Magyar MFvészeti Fesztiválok Szövetsége (art festivals).
- In 2019, the Csiky Gergely Theater in Kaposvár was refurbished using cultural development programs and in 2020, was refurbished the Kertész Imre Institute, the Kállay Mansion in Nyregyháza and Veszprém Zoo, the Szigligeti Theatre and Artist Colony in Szolnok, the National Cultural Institute.

Investors will always look for different ways to run a successful business, therefore they need to find a sustainable business and also cultural environment in with to invest and move the capital, as can be seen in the Table no. 5.

Country	M&A	RCR	EDUC	HLT	SP	POS	DEF	EP	HCA
Austria	68.44	1.39	6.29	8.19	21.08	1.33	0.60	0.42	0.32
Belgium	210.64	2.04	4.91	7.87	19.87	1.76	0.84	1.37	0.34
Bulgaria	87.81	1.27	3.69	5.00	12.57	2.56	1.20	0.73	1.40
Croatia	56.43	1.54	4.83	6.49	14.70	2.24	1.17	0.67	2.17
Cyprus	46.00	0.90	5.60	3.14	13.10	1.80	1.74	0.28	1.72
Czech Republic	77.29	1.37	4.50	7.72	13.12	1.80	0.83	0.95	0.71
Denmark	151.99	1.71	6.70	8.50	23.07	1.00	1.18	0.42	0.23
Estonia	99.52	1.57	5.97	5.54	12.70	1.90	2.04	0.72	0.44
Finland	51.87	1.44	5.99	7.41	24.75	1.22	1.33	0.22	0.34
France	44.28	1.47	5.41	8.18	24.56	1.62	1.80	1.00	1.13
Germany	43.51	1.04	4.32	7.30	19.48	1.57	1.04	0.60	0.42
Greece	16.77	0.97	4.22	5.56	20.50	2.12	2.36	1.45	0.23
Hungary	226.29	2.72	4.92	4.99	14.46	2.08	0.84	0.78	0.82
Ireland	439.30	2.02	3.79	5.77	11.33	1.15	0.31	0.50	0.62
Italy	26.33	0.74	4.01	7.06	21.35	1.80	1.27	0.91	0.50

Country	M&A	RCR	EDUC	HLT	SP	POS	DEF	EP	HCA
Latvia	56.43	1.56	5.77	3.92	11.86	2.08	1.50	0.62	1.08
Lithuania	45.06	1.02	4.92	4.83	13.12	1.55	1.42	0.56	0.40
Luxembourg	73.61	1.19	4.67	5.13	17.94	1.10	0.37	0.84	0.55
Malta	16.69	1.09	5.27	5.52	11.76	1.23	0.63	1.35	0.34
Netherlands	582.52	1.31	5.27	7.67	16.70	1.88	1.15	1.43	0.47
Poland	49.11	1.21	5.16	4.79	16.40	2.18	1.61	0.53	0.63
Portugal	80.20	0.91	4.96	6.46	18.14	1.82	0.94	0.62	0.47
Romania	44.69	1.02	3.17	4.40	11.91	2.18	1.36	0.73	1.13
Slovak Republic	67.49	0.99	4.11	6.52	14.93	2.37	1.01	0.83	0.54
Slovenia	35.78	1.52	5.78	6.82	18.04	1.65	0.95	0.70	0.58
Spain	64.20	1.16	4.13	6.30	17.91	1.90	0.92	0.90	0.46
Sweden	87.46	1.30	6.68	6.94	20.11	1.32	1.06	0.46	0.61

Source: IMAA 2022, EUROSTAT, ESA 2010. Values above average are highlighted in bold.

4. Conclusions

Companies will always look for ways to do business, which in business translates into increased profitability and reduced costs. In this highly inclusive world, companies are now looking around the globe for these opportunities, spending a lot of time and consuming a lot of resources to make more money or save money (to save more money on costs).

However, the task is very difficult, as each country has its own set of rules on trade operations. Although countries are generally open to foreign investors, the nature of each country's unique regulations makes an environment more difficult or easier to penetrate.

Companies should spend resources determining what type of environment government has created in its market so that it is never caught unaware but errors from assumptions or incorrect data can be extremely costly to firms.

The findings of our study point out the significant relationship that exists between the government's culture expenditures on mergers and acquisition. We can see that the highest number of mergers and acquisitions are

recorded in the most developed economies from Europe, but there are also states, especially Cyprus, Malta and Hungary, that are catching up.

So, entrepreneurs are looking not only for developed countries, but also to state where cultural and social factors can help them develop their company further. Thus, to help companies survive and boost their performance after M&A, which would generate positive effects on the economy, decision makers should take steps to develop the culture, recreation and entertainment and education segment.

Further research will analyze the impact of the war in Ukraine on the number of M & As. In the context in which several countries announced the increase of the defense budget in the coming years (Romania, Germany, etc.), we are curious to see how the budget impacts on education and RCR and whether investors will be attracted this time by countries with high defense. During the previous period, when there was peace in the world, investors fled the countries where investments were made in defense because their perception was that there were imminent conflicts.

REFERENCES

1. Afrăsinei, M. B., 2016, Contabilitatea și fiscalitatea societăților offshore. *C.H. Beck*, ISBN 978-606-18-0574-7.
2. Afrăsinei, M. B., 2019, Tax Optimization and Round Tripping of Capital: An Exploratory Study. *Journal of Public Administration, Finance and Law*, (15), 164-173.
3. Akalpler, E., Adil, H., 2017, The impact of foreign direct investment on economic growth in Singapore between 1980 and 2014. *Eurasian Economic Review*, 7, 435-450, <https://doi.org/10.1007/s40822-017-0071-3>.
4. Alexandridis G., Hoepner A.G.F., Huang Z., Oikonomou I., 2002, Corporate social responsibility

- culture and international M&As, *The British Accounting Review*.
<https://doi.org/10.1016/j.bar.2021.101035>.
5. Angwin D., 2007, Motive Archetypes in Mergers and Acquisitions (M&A): The Implications of a Configurational Approach to Performance, *Advances in Mergers and Acquisitions*, vol. 6, pp. 77-105, DOI: 10.1016/S1479-361X(07)06004-8.
 6. Aykut, D., Sanghi, A., Kosmidou, G., 2017, What to do when foreign direct investment is not direct or foreign: FDI round tripping. *World Bank Policy Research Working Paper*, DOI: 10.1596/1813-9450-8046.
 7. Bae, Y.; Lee, K.; Roh, T. 2020, Acquirer's Absorptive Capacity and Firm Performance: The Perspectives of Strategic Behavior and Knowledge Assets. *Sustainability*, 12, pp. 1-28, <https://doi.org/10.3390/su12208396>.
 8. Bayraktar, N., 2019, Effectiveness of public investment on growth in sub-Saharan Africa, *Eurasian Economic Review*, 9, DOI:10.1007/s40822-018-0119-z.
 9. Birkinshaw, J., Bresman, H., Håkanson, L., 2000, Managing the post-acquisition integration process: How the human integration and task integration processes interact to foster value creation, *Journal of Management Studies*, 37(3), DOI:10.1111/1467-6486.00186.
 10. Boateng A., Hua X., Uddin M., Du M., 2014, Home country macroeconomic factors on outward cross-border mergers and acquisitions: Evidence from the UK, *Research in International Business and Finance*, 30, DOI: 10.1016/j.ribaf.2013.08.001.
 11. Bouwman, C., 2013, The Role of Corporate Culture in Mergers & Acquisitions, Mergers and Acquisitions: Practices, Performance and Perspectives, *NOVA Science Publishers*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2307740.
 12. Cai, X.; Lu, Y.; Wu, M.; Yu, L., 2016, Do environmental regulations drive away inbound foreign direct investment? Evidence from a quasi-natural experiment in China. *Journal of Development Economics*, 123, DOI:10.1016/j.jdeveco.2016.08.003.
 13. Carp, M.; Păvăloaia, L.; Toma, C.; Georgescu, I.E.; Afrăsinei, M.-B. 2020, Companies' Sustainable Growth, Accounting Quality, and Investments Performances. The Case of the Romanian Capital Market. *Sustainability*, 12, 9748, <https://doi.org/10.3390/su12229748>.
 14. Cartwright S., Schoenberg R., 2006, Thirty Years of Mergers and Acquisitions Research: Recent Advances and Future Opportunities, *British Journal Management*, 17, DOI:10.1111/j.1467-8551.2006.00475.
 15. Castellacci, F., Oguguo, P.C., Freitas, I.M.B., 2022, Quality of pro-market national institutions and firms' decision to invest in R&D: evidence from developing and transition economies. *Eurasian Business Review*, 12, 35-57, <https://doi.org/10.1007/s40821-022-00202-7>.
 16. Chand, A., Jiang, R., Zhao, Z., 2021, National cultural distance and cross-border M&A, *Asia-Pacific Journal of Accounting & Economics*, DOI: 10.1080/16081625.2021.1947858.
 17. Chipalkatti N., Le Q.V., Rishi, M., 2021, Sustainability and Society: Do Environmental, Social, and Governance Factors Matter for Foreign Direct Investment? *Energies*, 14, DOI:3390/en14196039.
 18. Ciobanu, R., Bahna, M. 2015, The Social, Cultural and Political Factors that Influence the Level of Mergers and Acquisitions. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 5(3), DOI: 10.6007/IJARAFMS/v5-3/1738.
 19. Deal, T.E, Kennedy, A.A., 1982, Corporate Cultures: The Rites and Rituals of Corporate Life, *Addison Wesley Publishing Company*, Available at [https://www.scirp.org/\(S\(351jmbntvnsjt1aadkposzje\)\)/reference/ReferencesPapers.aspx?ReferenceID=1122424](https://www.scirp.org/(S(351jmbntvnsjt1aadkposzje))/reference/ReferencesPapers.aspx?ReferenceID=1122424).
 20. Deng, P., Yang, M., 2014, Cross-border mergers and acquisitions by emerging market firms: A comparative investigation, *International Business Review*, 24(1), DOI: 10.1016/j.ibusrev.2014.07.005.
 21. Depamphilis, D.M., 2015, Mergers, Acquisitions, and other restructuring Activities, *Elsevier*, ISBN: 9780128024539.
 22. Doytch, N., Cakan E., 2011, Growth Effects of Mergers and Acquisitions: A Sector-level Study of OECD countries, *Journal of Applied Economics and Business Research*, (3): 120-129.

23. Dreher, A., Gason, N., 2008, Has Globalization Increased Inequality? *Review of International Economics*, 16(3), DOI: <https://doi.org/10.1111/j.1467-9396.2008.00743.x>.
24. Erel, I., Liao, R., Weisbach, M., 2012, Determinants of Cross-Border Mergers and Acquisitions, *The Journal of Finance*, <https://doi.org/10.1111/j.1540-6261.2012.01741.x>.
25. European Commission, 2019, Economic and financial affairs, Available online at https://ec.europa.eu/info/economic-and-financial-affairs-website-notice-users_en (accessed on 17 June 2022).
26. EUROSTAT, COFOG, 2022, Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Government_expenditure_by_function_%E2%80%93_COFOG&oldid=556320.
27. Farooq, M., Azis, S., Dowling, M.M., 2022, Does Target Country Cultural Orientation Influence M&A? *British Journal Management*, <https://doi.org/10.1111/1467-8551.12462>.
28. Figlio, D.N., Blonigen, B.A., 2000, The effects of foreign direct investment on local Communities, *Journal of urban economics*, 48(2), DOI:10.1006/juec.2000.2170.
29. Frensch, F., 2007, The social side of mergers and acquisitions. Cooperation relationship after mergers and acquisitions. *Deutscher Universitätsverlag*, ISBN 978-3-8350-07543
30. Gadiesh, C. and Ormiston, C., 2002, Six rationales to guide merger success, *Strategy and Leadership*, 30, DOI:10.1108/sl.2002.26130dab.001.
31. Garrett, G. and Mitchell, D., 2001, Globalization, government spending and Taxation in OECD, *European Journal of Political Research*, 39, DOI: DOI:10.1111/1475-6765.00573.
32. Gemmel, N., Kneller, R., Sanz, I., 2007, Foreign investment, international trade and the size and structure of public expenditures, *European Journal of Political Economy*, DOI: <https://doi.org/10.1016/j.ejpoleco.2007.06.004>.
33. Georgescu, I., Istrate, C., Huian, M.C., Afrăsinei, M.B., 2020, Reorganizarea societăților – abordări contabile și juridice, *Editura Universității Alexandru Ioan Cuza din Iași*, ISBN: 978-606-714-530-4.
34. Godfred, K.-A., 2016, Mergers and Acquisitions failure rates and perspectives on why they fail, *International Journal of Innovation and Applied Studies*, 17(10): 150-158, ISSN 2028-9324.
35. Gulen, H., Ion, M., 2016, Policy Uncertainty and Corporate Investment, *The Review of Financial Studies*, vol. 29, Iss. 3, pp. 523-564, DOI:10.1093/rfs/hhv050.
36. Gunkela, M., Schlaegelb, C., Rossteutscherb, T., Wol, B., 2015, The human aspect of cross-border acquisition outcomes: The role of management practices, employee emotions, and national culture, *International Business Review*, <https://doi.org/10.1016/j.ibusrev.2014.09.001>.
37. Gunther, T., 2001, What Do We Know about Success and Failure of Mergers? *Journal of Industry, Competition and Trade*, 1:4, <https://link.springer.com/content/pdf/10.1023/A:1019521325295.pdf>.
38. Hitt, M.A., King, D., Krishnan, H., Zhu, H., 2009, Mergers and Acquisitions: Overcoming Pitfalls, Building Synergy, and Creating Value, *Business Horizons*, 52, DOI: 10.1016/j.bushor.2009.06.008.
39. Hoetzel, B.R., 2005, Cultural Impact in Cross-Border Acquisitions: A Critical Review of the Literature, *Germany: University of Applied Sciences Heilbronn. Working Papers*, Available at <https://www.competence-site.de/cultural-impact-in-cross-border-acquisitions/> (accessed on 12 July 2022).
40. Houwers, R., 2016, M&A Failure Factors, *University of Twente*, Available online at: <https://essay.utwente.nl/70883/1/MASTER%20THESIS.pdf> (accessed on 01.04.2022).
41. Hsueh, S.J., Tsao, Y.C., Tu, C.H., Chiu, Y.H., Liu, S.B., 2014, Can M&A activities act as a predictor of the performance of economic growth or stock prices? *Economic Modelling*, <https://doi.org/10.1016/j.econmod.2014.07.028>.
42. Iamandi, I.E., Munteanu, S. M., 2014, Corporate Social Responsibility through Education and Sport. An EU Comparative Case. *Romanian Economic Journal*, 17, RePEc:rej:journl:v:17:y:2014:i:54:p:73-97.
43. Johnson, P., 2007, *The Economics of Small Firms*, Routledge, London, ISBN 9780415393386.
44. Keller, W., Levinson, A., 2002, Pollution Abatement Costs and Foreign Direct Investment Inflows to U.S.

- States, *The Review of Economics and Statistics*, 84, 4, pp. 691-703, <https://doi.org/10.1162/003465302760556503>.
45. Kittel, B., Winner, H., 2005, How reliable is pooled analysis in political economy? The Globalization welfare state nexus revisited. *European Journal of Political Research*, 44, DOI: <https://doi.org/10.1111/j.1475-6765.2005.00228.x>.
 46. Langosch, M., Tumlinson, J., 2020, Whom to Acquire? – Culture, Country or Kilometers in Target Selection, SSRN, <http://dx.doi.org/10.2139/ssrn.3586763>.
 47. Ledyaeva, S., Karhunen, P., Kosonen, R., & Whalley, J., 2015, Offshore foreign direct investment, capital round-tripping, and corruption: Empirical analysis of Russian regions. *Economic Geography*, 91(3), 305-341, <http://www.jstor.org/stable/43966918>.
 48. Lee, K.H., Mauer, D.C., Xu, E.Q, 2018, Human capital relatedness and mergers and acquisitions, *Journal of Financial Economics*, <https://doi.org/10.1016/j.jfineco.2018.03.008>.
 49. Lin, Y., Wang, Y.M., Shi, H.L., 2020, Mergers and acquisitions matching for performance improvement: a DEA-based approach, *Economic Research*, DOI: 10.1080/1331677X.2020.1775673.
 50. Lubatkin, H., 1983, Mergers and the performance of the acquiring firm, *Academy of Management Review*, 8, DOI:10.5465/amr.1983.4284724.
 51. Lynch, J.G and Lind, B., 2002, Escaping merger and acquisition madness, *Strategy and Leadership*, 30, DOI: 10.1108/10878570210422094.
 52. McCarthy, K.J., 2011, Understanding success and failure in mergers and acquisitions, *University of Groningen*, ISBN: 978-90-367-4755-4.
 53. M&A Statistics, IMAA, 2022, Available online at <https://imaa-institute.org/mergers-and-acquisitions-statistics/> (accessed on 02 August 2022).
 54. Meglio, O. 2020, Towards More Sustainable M&A Deals: Scholars as Change Agents. *Sustainability*, 12, 9623. <https://doi.org/10.3390/su12229623>.
 55. Mladen, V., Bobek, V., Macek, A., Skoko, H., Horvat, T., 2020, Business environment and foreign direct investments: The case of selected European emerging economies, *Economic Research*, 33, DOI:10.1080/1331677X.2019.1710228.
 56. Moore, F., 2021, National culture as an integrating agent in the post-acquisition organization, *The International Journal of Human Resource Management*, 32:13, DOI: 10.1080/09585192.2019.1602550.
 57. Peters, T. and Waterman, R.H., 1982, In search of excellence: Lessons from America's best-run companies, *New York: Harper & Row Publishers*. <https://doi.org/10.1177/01926365830674662>.
 58. Phuong, N.L., 2021, Literature Review on the Impacts of Foreign Direct Investment in the Emerging Economy: The Case of Vietnam. *Open Journal of Business and Management*, 9, <https://doi.org/10.4236/ojbm.2021.92044>.
 59. Plumber, T., Manow, P., Troeger, V., 2005, Pooled data analysis in comparative Political economy of the welfare state; A note on methodology and theory, *European journal of political research*, 44(2). DOI:10.1111/j.1475-6765.2005.00230.x.
 60. Renneboog, L., Vansteenkiste, C., 2019, Failure and success in mergers and acquisitions, *Journal of Corporate Finance*, <https://doi.org/10.1016/j.jcorpfin.2019.07.010>.
 61. Ritesh, P., 2018, Pre & Post-Merger Financial Performance: An Indian Perspective, *Journal of Central Banking Theory and Practice*, <https://doi.org/10.2478/jcbtp-2018-0029>.
 62. Saahdong, I., 2010, The relationship between globalization and public spending. Empirical evidence from Nordic countries, *Lund University*, Available at <https://www.lunduniversity.lu.se/lup/publication/1848601>.
 63. Salame, R., 2006, Why do mergers fail? What can be done to improve their chances of success? *Key Strategy*. Available at <https://www.scribd.com/document/109250180/Why-Do-Mergers-Fail>.
 64. Schoenberg, R., Cartwright, S., 2006, Thirty Years of Mergers and Acquisitions Research: Recent Advances and Future Opportunities, *British Journal Management*, 17, DOI:10.1111/j.1467-8551.2006.00475.x.
 65. Schraeder, M., Self, D.R., 2003, Enhancing the success of mergers and acquisitions: An organizational Culture perspective, *Management Decision*, 41. DOI: 10.1108/00251740310479359.

66. Steigenberger, N., 2016, The Challenge of Integration: A Review of the M&A Integration Literature, *International Journal of Management Review*, <https://doi.org/10.1111/ijmr.12099>.
67. Straub, T., 2007, Reasons for frequent failures in mergers and acquisitions. A comprehensive analysis, *DUV Germany*, ISBN 978-3-8350-0844-1.
68. Tanzi, V., 2002, Globalization and Future of Social Protection, *Scottish journal of Political Economy*, 49. <https://doi.org/10.1111/1467-9485.00224>.
69. Teti, E., Dell'Acqua, A. Bonsi, P., 2022, Detangling the role of environmental, social, and governance factors on M&A performance, *Corporate social responsibility environmental Management*, <https://doi.org/10.1002/csr.2325>.
70. Uzelac, B., Bauer, F., Matzler, M., Waschak, M., 2015, The moderating effects of decision-making preferences on M&A integration speed and performance, *The International Journal of Human Resource Management*, 27(20):1-27, DOI: 10.1080/09585192.2015.1116457.
71. Vaara, E., Whittington, R., 2012, Strategy-as-Practice: Taking Social Practices Seriously, *The Academy of Management Annals*, 6:1. DOI: 10.1080/19416520.2012.672039.
72. Zahoor, A.; Michael, C.; Sajid, A.; Muntasir, M.; Hamid, U.; Haider, M., 2021, Moving toward a green revolution in Japan: Symmetric and asymmetric relationships among clean energy technology development investments, economic growth, and CO2 emissions, *Energy & Environment*, 89. <https://doi.org/10.1177/0958305X2111041780>

Camera Auditorilor Financiari
af
din România



64226571000013